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C.F. Højerup

Abstract. Calculations of the gamma doses at a TOKAMAK fusion reactor, the NET-DN (1988) are presented. Neutron fluxes in the structures of the reactor are calculated by Monte Carlo methods (MCNP-2) and activations from the neutron induced reactions are determined by the ACTIVA computer programme. By Monte Carlo methods and the application of an approximative reciprocity principle, the gamma fluxes and doses are finally calculated.

July 1989
Risø National Laboratory, DK-4000 Roskilde, Denmark

CONTENTS

INTRODUCTION

Under the EEC Fusion Technology programme, Euratom-Risø-Contract no. 207-85-1, S & E 5.1.1, a computer programme has been made, capable of calculating the gamma doses in selected points in and around the NET-DN, as well during power operation as during shut down periods.

The pattern of calculations is as follows:

1. Determine neutron fluxes in all parts of the TOKAMAK from the fusion source.

2. Determine gamma fluxes in all parts of the TOKAMAK from a unit source in the point where the dose is wanted.

3. Make calculations of neutron induced activities in all parts of the TOKAMAK.

4. Apply a "reciprocity" principle to estimate the gamma dose from the distributed sources.

ad 1

The Monte Carlo code MCNP2 is used for neutron flux calculations. It is difficult and costly to obtain fluxes in the outer parts of the reactor. The possibility of combining MC-methods with other transport methods ought to be looked into.

ad 2

The above considerations hold for the gamma flux calculations.

ad 3

The programme ACTIVA, which has been developed during the project, has been tested with satisfactory result in an ISPRA conducted benchmark as regards the built-up of isotopes.

ad 4

The reciprocity principle referred to enables the calculations to be performed with a reasonable computing effort. As the "reciprocity" is not mathematically exact, the application of it introduces some degree of uncertainty.

Calculations were performed on the NET-DN configuration valid in 1987 and reported in the paper Risø-I-324, November 1987.

The calculations were repeated for a new configuration introduced around the end of 1987, and these results are presented in the present paper.

The methods and details about input/output, data files etc. are described in the above mentioned paper, Risø-I-324, and will not be repeated here. Only the summary results for the new design are presented here.

This report marks the end of the work under the S & E 5.1.1 contract, although some of the problems mentioned previously could have deserved a further development.

1. MCNP2 CALCULATIONS OF NEUTRON FLUX

The NET-DN has been modelled as a 1/32 segment with reflective boundaries. The geometry is shown in Fig. 1.1, where also the "cell"-numbering for the MCNP2 is indicated.

The tori are replaced by pieces of cylinders, which simplifies the geometry without imposing any serious deviations from reality. In order to get fluxes as output from MCNP2, the volumes of the cells have to be given as input. An ad hoc programme was written, VOLUME, which calculates by numerical integration the volumes of the present geometry based on the MCNP2 input specifications. The energy structure of the flux was taken to be the REAC-ECN 100 group structure (table 1.1) in order to be able to use that cross section set in subsequent activation calculations. The source was modelled as a volume source of 14 MeV neutrons, shaped as a cylinder around the centre-line of the torus.

Some results of the neutronic calculations are shown in Figs. 1.2 through 1.4 where the found spectra are plotted for selected cells. There are 3 cells per plot, and the cells have been so selected as to allow an intercomparison of the plots. The cell numbers refer to Fig. 1.1.

The fluxes in the outer parts of the TOKAMAK are poorly determined due to the Monte Carlo technique and the limited number of histories.

TABLE 1.1

100 GROUP ENERGY STRUCTURE

UPPER ENERGIES(MEV):

GROUP	1	2	3	4	5
ENERGY	0.4140E-06	0.5316E-06	0.6826E-06	0.8764E-06	0.1125E-05
GROUP	6	7	8	9	10
ENERGY	0.1445E-05	0.1855E-05	0.2382E-05	0.3059E-05	0.3928E-05
GROUP	11	12	13	14	15
ENERGY	0.5044E-05	0.6476E-05	0.8315E-05	0.1068E-04	0.1371E-04
GROUP	16	17	18	19	20
ENERGY	0.1760E-04	0.2260E-04	0.2902E-04	0.3727E-04	0.4785E-04
GROUP	21	22	23	24	25
ENERGY	0.6144E-04	0.7889E-04	0.1013E-03	0.1301E-03	0.1670E-03
GROUP	26	27	28	29	30
ENERGY	0.2145E-03	0.2754E-03	0.3536E-03	0.4540E-03	0.5830E-03
GROUP	31	32	33	34	35
ENERGY	0.7485E-03	0.9611E-03	0.1234E-02	0.1585E-02	0.2035E-02
GROUP	36	37	38	39	40
ENERGY	0.2613E-02	0.3355E-02	0.4307E-02	0.5531E-02	0.7102E-02
GROUP	41	42	43	44	45
ENERGY	0.9119E-02	0.1171E-01	0.1503E-01	0.1931E-01	0.2479E-01
GROUP	46	47	48	49	50
ENERGY	0.3183E-01	0.4087E-01	0.5248E-01	0.6738E-01	0.8652E-01
GROUP	51	52	53	54	55
ENERGY	0.1111E+00	0.1228E+00	0.1357E+00	0.1500E+00	0.1657E+00
GROUP	56	57	58	59	60
ENERGY	0.1832E+00	0.2024E+00	0.2237E+00	0.2472E+00	0.2732E+00
GROUP	61	62	63	64	65
ENERGY	0.3020E+00	0.3337E+00	0.3683E+00	0.4076E+00	0.4505E+00
GROUP	66	67	68	69	70
ENERGY	0.4979E+00	0.5502E+00	0.6081E+00	0.6721E+00	0.7427E+00
GROUP	71	72	73	74	75
ENERGY	0.8209E+00	0.9072E+00	0.1003E+01	0.1108E+01	0.1225E+01
GROUP	76	77	78	79	80
ENERGY	0.1353E+01	0.1496E+01	0.1653E+01	0.1827E+01	0.2019E+01
GROUP	81	82	83	84	85
ENERGY	0.2231E+01	0.2466E+01	0.2725E+01	0.3012E+01	0.3329E+01
GROUP	86	87	88	89	90
ENERGY	0.3679E+01	0.4066E+01	0.4493E+01	0.4966E+01	0.5488E+01
GROUP	91	92	93	94	95
ENERGY	0.6065E+01	0.6703E+01	0.7408E+01	0.8187E+01	0.9048E+01
GROUP	96	97	98	99	100
ENERGY	0.1000E+02	0.1105E+02	0.1221E+02	0.1350E+02	0.1492E+02

FIG. 1.1

NET–DN CROSS SECTION

NUMBERS REFER TO CELL IDENTIFICATION IN MCNP2

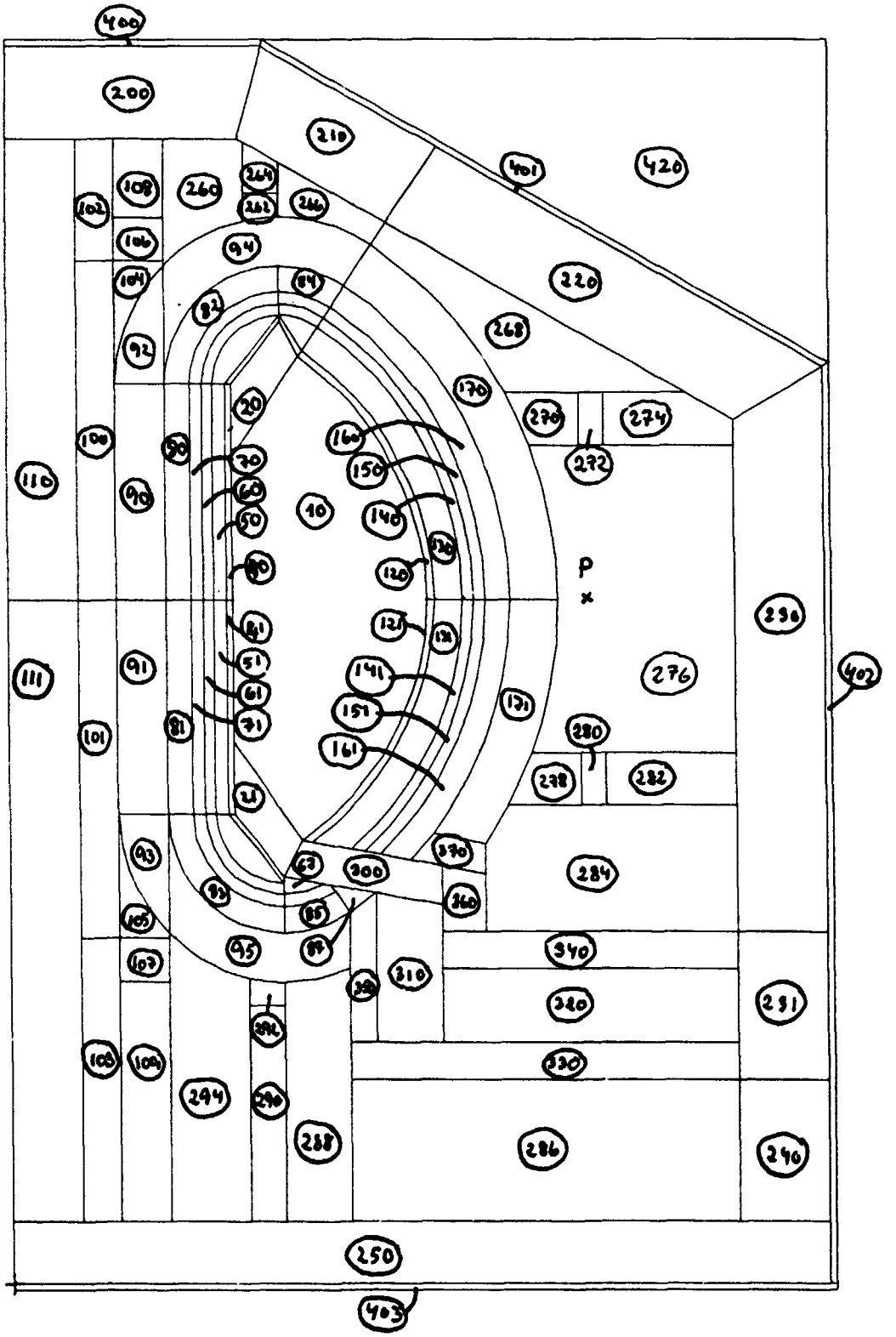


FIG. 1.2

NEUTRON FLUX IN NET CELLS

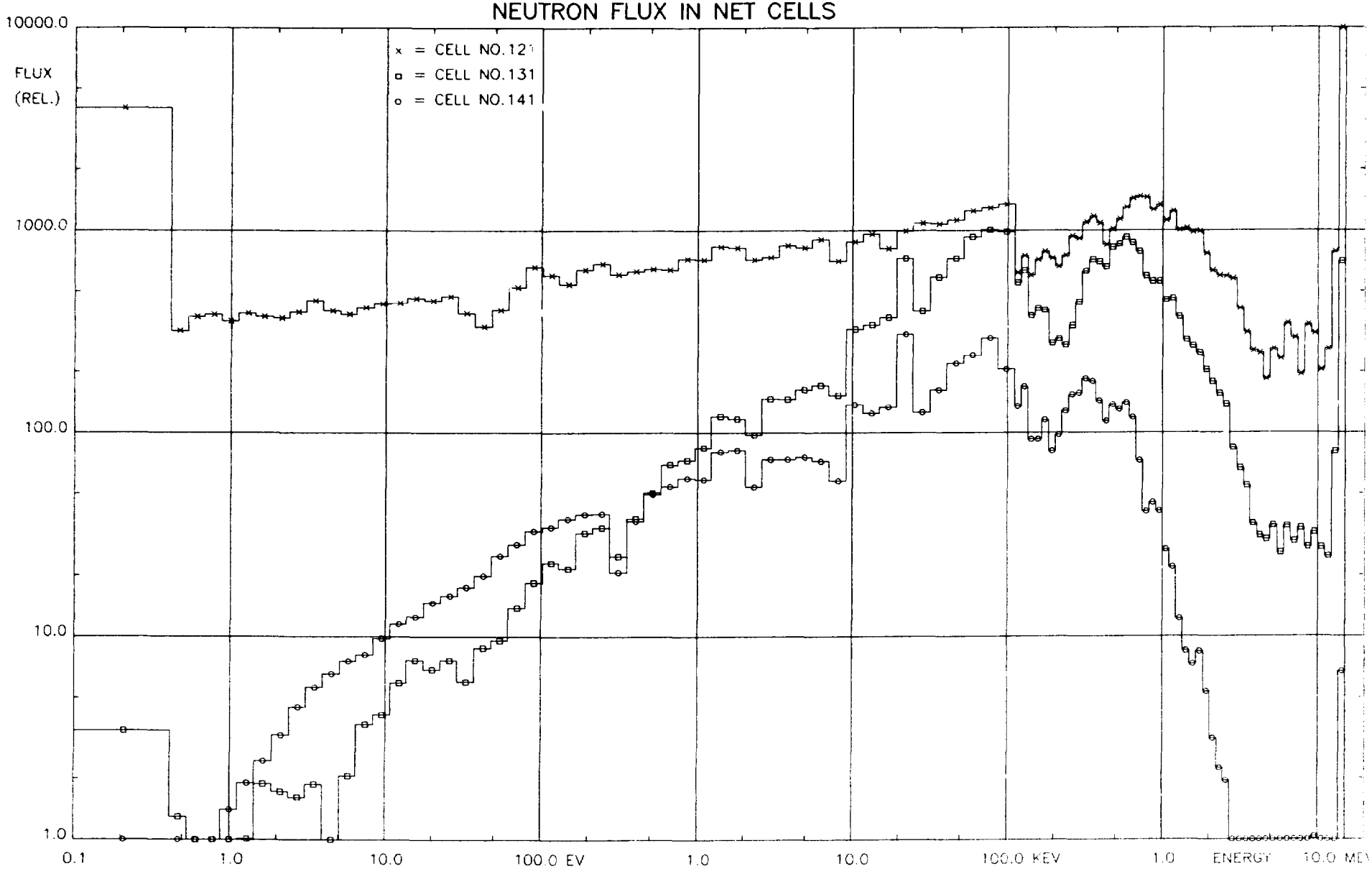


FIG. 1.3

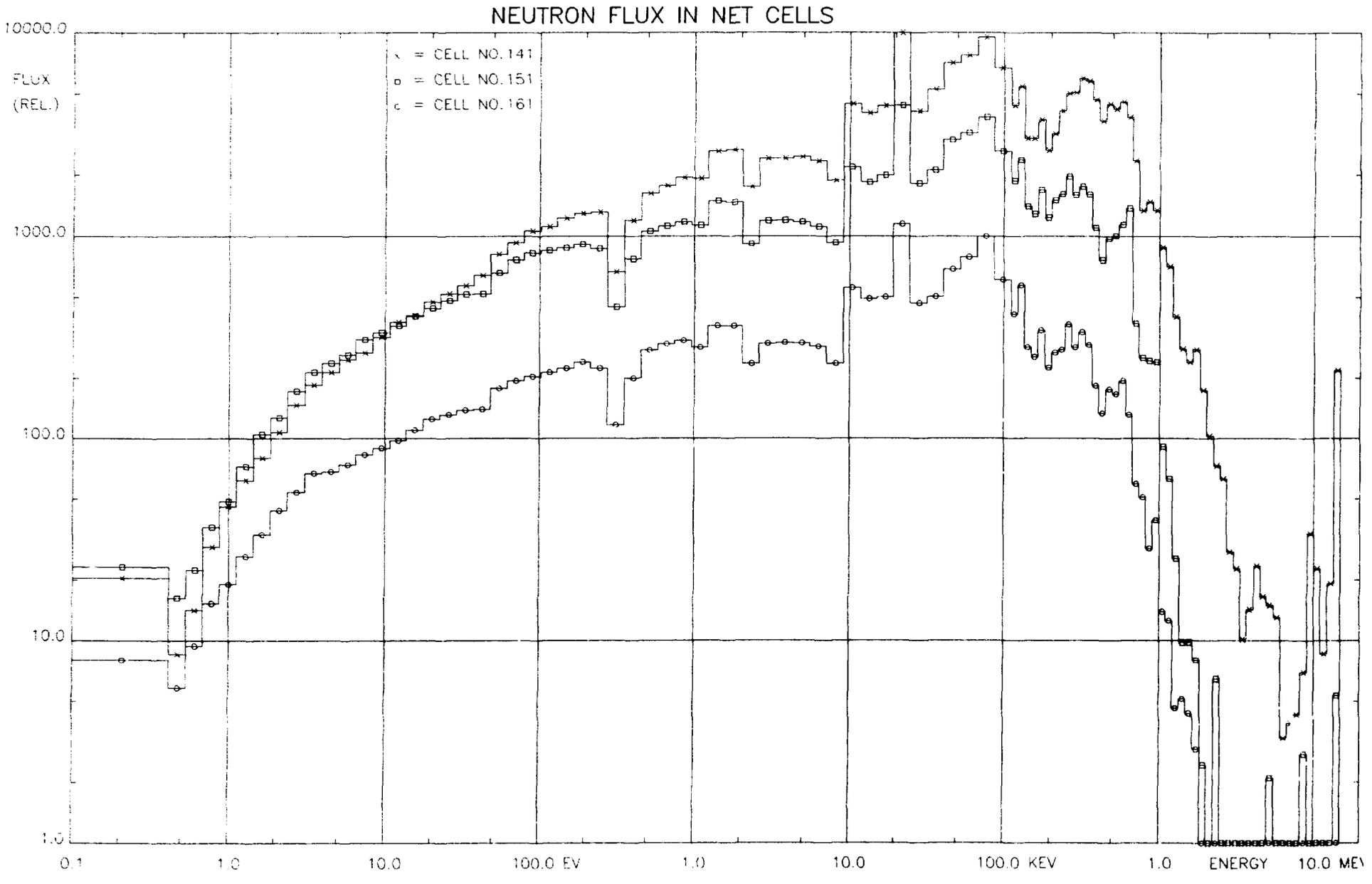
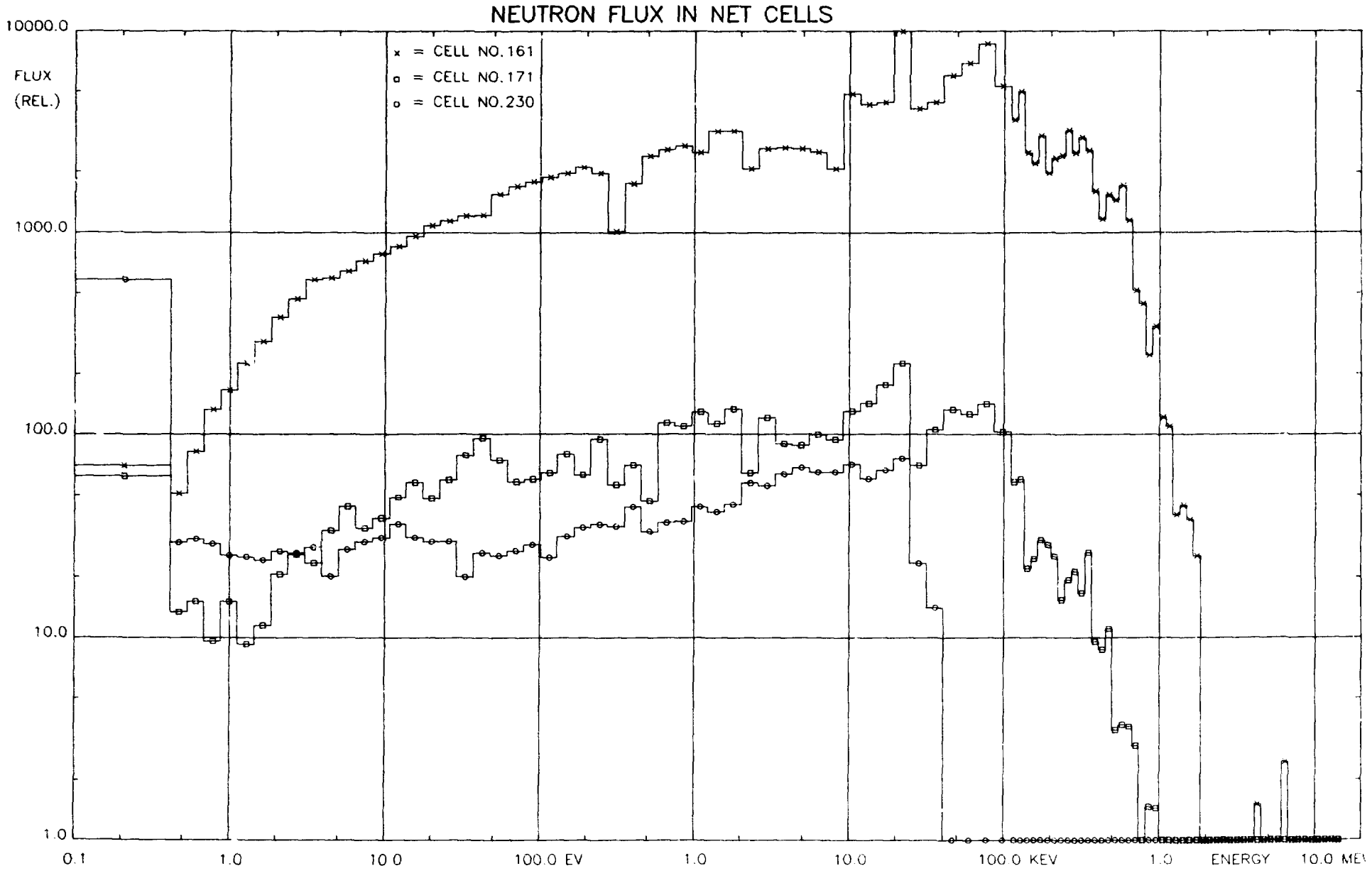

NEUTRON FLUX IN NET CELLS
FLUX
(REL.)
10000.0
1000.0
100.0
10.0
1.0
× = CELL NO.141
□ = CELL NO.151
○ = CELL NO.161
0.1
1.0
10.0
100.0 EV
1.0
10.0
100.0 KEV
1.0
ENERGY
10.0 MEV

FIG. 1.4


NEUTRON FLUX IN NET CELLS
10000.0
FLUX
(REL.)
1000.0
100.0
10.0
1.0
x = CELL NO.161
o = CELL NO.171
o = CELL NO.230
0.1
1.0
10.0
100.0 EV
1.0
10.0
100.0 KEV
1.0
ENERGY
10.0 MEV

2. CALCULATION OF GAMMA FLUXES

The gamma fluxes in all cells of the reactor due to monoenergetic point sources placed in the area, where the gamma dose is wanted (the point P in Fig. 1.1) have been calculated.

Successive calculations, 6 in all, with source energies corresponding to the 6 gamma groups, have been made, and from them, the response matrix relating the gamma flux in the point P to distributed sources in all the cells, is constructed. The quality of this "reciprocal" approach is touched upon in the previously mentioned report, Risø-I-324.

3. CALCULATION OF ACTIVATION PRODUCTS AND ASSOCIATED GAMMA EMISSION

To get the distributed gamma sources mentioned in section 2, activation calculations are performed for all cells.

The activations are due to the neutron interactions with the construction materials.

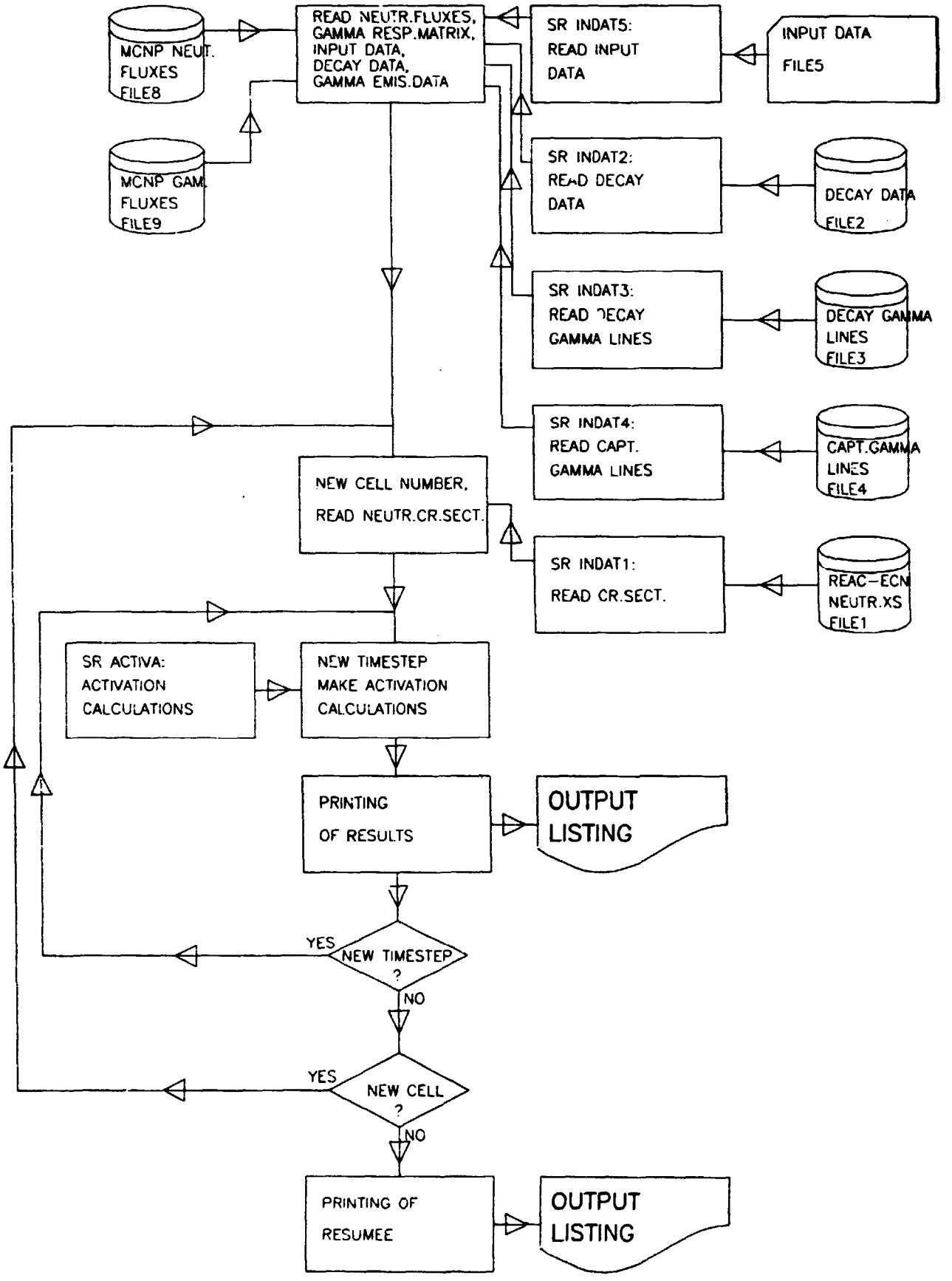
The programme ACTIVA, also described in Risø-I-324, performs the calculations, taking into account a large number of possible neutron reactions.

A flow diagram for the ACTIVA programme is shown in Fig. 3.1. When the concentrations of the radio-active nuclides are known, the gamma sources can be calculated using compilations of gamma line emissions.

Also, neutron captures give rise to emission of gammas. The latter are by far the dominant ones during power operation, while the former ones are the unpleasant contributors to the radiation during shut down and to the rad-waste problem.

F I G. 3.1

FLOWDIAGRAM FOR THE ACTIVA PROGRAMME



4. RESULTS

The neuron source strength from the plasma is taken of 80% of 1/32 of the assumed thermal power of 600 MW carried away as 14 MeV neutrons

$$Q = 600 \cdot 10^6 \cdot 0.80/(32 \cdot 14 \cdot 1.6 \cdot 10^{-13}) = 6.7 \cdot 10^{18} \text{ n/sec}$$

One year of full power operation has been assumed and times after shut down of 1, 5, 10, 30, 100, and 360 days are considered.

The following pages give the main results of the calculations.

The first pages mainly reproduce input specifications and then follow the contributions to the dose rate at the specified times from all the cells. Also, the volumes of the cells, the specific activities in the cells, and the mean energies of the emitted gamma radiation are listed.

```
PRINT OPTIONS FOR   MAIN INDAT1 INDAT2 INDAT3 INDAT4 ACTIVA
                     0      0      0      0      0      0

UPPER ENERGY BOUNDARIES FOR GAMMA GROUPS:

GROUP                 1       2       3       4       5       6
UP.BOUNDS(MEV):   0.500   1.000   2.000   4.000   6.000  10.000

ENERGYABSORPTION COEFFICIENTS FOR GAMMA RAYS IN AIR  (CM2/G):

GROUP                 1       2       3       4       5       6
MUAIR(CM2/G):   0.0280  0.0290  0.0250  0.0210  0.0170  0.0150

NEUTRON SOURCE=    6.70000E+18 N/SEC

NUMBER OF TIME STEPS TOTAL   =   10

NUMBER OF TIME STEPS AT POWER=    4

TIMES AT POWER(DAYS):
    90.00000   180.00000   270.00000   360.00000

TIMES AT ZERO POWER(DAYS):
   361.00000   365.00000   370.00000   390.00000   460.00000   720.00000



MATERIAL NO.    1
 TRITIUM
DENS        = 1.00000E-12 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:
 ISOTOPE   CONCENTRATION
           (10**24 AT/CC
 1 H  3G:     2.008467E-13



MATERIAL NO.    2
 AIR
DENS        = 1.22500E-03 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:
 ISOTOPE   CONCENTRATION
           (10**24 AT/CC
 7 N 14G:     4.096478E-05
 7 N 15G:     1.480060E-07
 8 O 16G:     9.661806E-06
 8 O 17G:     3.874020E-09
 8 O 18G:     1.937010E-08
18AR 36G:     6.276270E-11
18AR 38G:     1.107577E-11
18AR 40G:     1.838578E-08
```

MATERIAL NO. 3
STAINL.STEEL+WATER
DENS = 6.70000 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:

ISOTOPE	CONCENTRATION (10**24 AT/CC
1 H 1G:	7.143379E-03
1 H 2G:	1.428819E-06
5 B 10G:	6.867708E-07
5 B 11G:	3.045679E-06
6 C 12G:	4.320894E-05
6 C 13G:	4.850028E-07
7 N 14G:	5.744929E-06
7 N 15G:	2.075647E-08
8 O 16G:	3.545592E-03
8 O 17G:	1.421649E-06
8 O 18G:	7.108243E-06
13AL 27G:	3.588460E-05
14SI 28G:	4.558824E-04
14SI 29G:	2.312268E-05
14SI 30G:	1.506927E-05
15 P 31G:	1.432490E-05
16 S 32G:	7.177839E-06
16 S 33G:	5.585280E-08
16 S 34G:	3.170024E-07
16 S 36G:	1.509535E-09
22TI 46G:	5.357375E-07
22TI 47G:	5.222598E-07
22TI 48G:	4.949675E-06
22TI 49G:	3.713099E-07
22TI 50G:	3.598539E-07
23 V 50G:	3.400754E-07
23 V 51G:	1.413580E-04
24CR 50G:	5.538003E-04
24CR 52G:	1.066734E-02
24CR 53G:	1.209449E-03
24CR 54G:	3.004526E-04
25MN 55G:	1.413690E-03
26FE 54G:	2.591305E-03
26FE 56G:	4.067994E-02
26FE 57G:	9.628652E-04
26FE 58G:	1.375522E-04
28NI 58G:	6.706446E-03
28NI 60G:	2.614881E-03
28NI 61G:	1.148093E-04
28NI 62G:	3.671918E-04
28NI 64G:	9.402485E-05
29CU 63G:	4.867228E-05
29CU 65G:	2.176517E-05
41NB 93G:	3.516112E-05
42MO 92G:	2.246074E-04
42MO 94G:	1.291563E-04
42MO 95G:	2.223415E-04
42MO 96G:	2.336710E-04
42MO 97G:	1.338297E-04
42MO 98G:	3.363446E-04
42MO100G:	1.362372E-04
73TA180G:	1.686181E-09
73TA181G:	1.404982E-05

MATERIAL NO. 4
STAINL.STEEL
DENS = 7.71000 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:

ISOTOPE	CONCENTRATION (10**24 AT/CC
5 B 10G:	7.902990E-07
5 B 11G:	3.504804E-06
6 C 12G:	4.972253E-05
6 C 13G:	5.581151E-07
7 N 14G:	6.610956E-06
7 N 15G:	2.388543E-08
8 O 16G:	1.737435E-05
8 O 17G:	6.966459E-09
8 O 18G:	3.483230E-08
13AL 27G:	4.129407E-05
14SI 28G:	5.337550E-04
14SI 29G:	2.707243E-05
14SI 30G:	1.764336E-05
15 P 31G:	1.648433E-05
16 S 32G:	8.259871E-06
16 S 33G:	6.427240E-08
16 S 34G:	3.647893E-07
16 S 36G:	1.737092E-09
22TI 46G:	6.935602E-07
22TI 47G:	6.761121E-07
22TI 48G:	6.407798E-06
22TI 49G:	4.806939E-07
22TI 50G:	4.658631E-07
23 V 50G:	3.978993E-07
23 V 51G:	1.653935E-04
24CR 50G:	6.475323E-04
24CR 52G:	1.247281E-02
24CR 53G:	1.414151E-03
24CR 54G:	3.513049E-04
25MN 55G:	1.652983E-03
26FE 54G:	3.029828E-03
26FE 56G:	4.756415E-02
26FE 57G:	1.125809E-03
26FE 58G:	1.608299E-04
28NI 58G:	7.841149E-03
28NI 60G:	3.057308E-03
28NI 61G:	1.342346E-04
28NI 62G:	4.293191E-04
28NI 64G:	1.099335E-04
29CU 63G:	5.701863E-05
29CU 65G:	2.549747E-05
41NB 93G:	4.146058E-05
42MO 92G:	2.626114E-04
42MO 94G:	1.510098E-04
42MO 95G:	2.599621E-04
42MO 96G:	2.732085E-04
42MO 97G:	1.564740E-04
42MO 98G:	3.932547E-04
42MO100G:	1.592889E-04
73TA180G:	1.971166E-09
73TA181G:	1.642441E-05

MATERIAL NO. 5
CUPPER+WOLFRAM
DENS = 14.12000 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:

ISOTOPE	CONCENTRATION (10**24 AT/CC
29CU 63G:	2.372994E-02
29CU 65G:	1.061151E-02
74 W180G:	4.813946E-05
74 W182G:	9.077728E-03
74 W183G:	4.951488E-03
74 W184G:	1.052191E-02
74 W186G:	9.765434E-03

MATERIAL NO. 6
LITHIUM-LEAD
DENS = 5.78000 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:

ISOTOPE	CONCENTRATION (10**24 AT/CC
3LI 6G:	1.100569E-04
3LI 7G:	1.353466E-03
6 C 12G:	2.867367E-06
6 C 13G:	3.218503E-08
13AL 27G:	1.289882E-06
14SI 28G:	2.286533E-05
14SI 29G:	1.159746E-06
14SI 30G:	7.558171E-07
15 P 31G:	1.123446E-06
23 V 50G:	1.638986E-08
23 V 51G:	6.812718E-06
24CR 50G:	2.767702E-05
24CR 52G:	5.331167E-04
24CR 53G:	6.044407E-05
24CR 54G:	1.501558E-05
25MN 55G:	7.092005E-05
26FE 54G:	1.295754E-04
26FE 56G:	2.034156E-03
26FE 57G:	4.814701E-05
26FE 58G:	6.878144E-06
28NI 58G:	3.352959E-04
28NI 60G:	1.307337E-04
28NI 61G:	5.740013E-06
28NI 62G:	1.835814E-05
28NI 64G:	4.700872E-06
29CU 63G:	2.269672E-06
29CU 65G:	1.014947E-06
41NB 93G:	1.872409E-06
42MO 92G:	1.122195E-05
42MO 94G:	6.452978E-06
42MO 95G:	1.110874E-05
42MO 96G:	1.167480E-05
42MO 97G:	6.686474E-06
42MO 98G:	1.680463E-05
42MO100G:	6.806759E-06
73TA180G:	9.235846E-11
73TA181G:	7.695615E-07
82PB204G:	2.338015E-04
82PB206G:	3.728186E-03
82PB207G:	3.570212E-03
82PB208G:	8.262039E-03

MATERIAL NO. 7
CONCRETE
DENS = 2.20000 G/CC
THE FOLLOWING MATERIAL SPECIFICATION IS MADE:

ISOTOPE	CONCENTRATION (10**24 AT/CC
8 O 16G:	4.369352E-02
8 O 17G:	1.751946E-05
8 O 18G:	8.759728E-05
13AL 27G:	2.386058E-03
14SI 28G:	1.455588E-02
14SI 29G:	7.382844E-04
14SI 30G:	4.811469E-04
20CA 40G:	2.823050E-03
20CA 42G:	1.863207E-05
20CA 43G:	4.366892E-06
20CA 44G:	5.997199E-05
20CA 46G:	8.733785E-08
20CA 48G:	5.385834E-06

MATERIAL NUMBERS SPECIFICATIONS, VOLUMES AND CELL NAMES:

CELLNO	MATNO	VOLUME	CELLNAME
10	1	1.88228E+07	PLASMA
40	3	2.51785E+05	FIRST WALL
41	3	2.51785E+05	FIRST WALL
42	3	7.77726E+04	FIRST WALL
43	3	7.77726E+04	FIRST WALL
50	6	5.35048E+05	INB. BLANKET
51	6	5.35048E+05	INB. BLANKET
52	6	3.67715E+05	INB. BLANKET
53	6	3.67715E+05	INB. BLANKET
60	4	4.03734E+05	VACUUM VESSEL
61	4	4.03734E+05	VACUUM VESSEL
62	4	2.54015E+05	VACUUM VESSEL
63	4	2.54015E+05	VACUUM VESSEL
64	4	1.23689E+05	VACUUM VESSEL
65	4	8.73115E+04	VACUUM VESSEL
67	4	3.02048E+04	VACUUM VESSEL
70	4	4.51373E+05	VACUUM VESSEL
71	4	4.51373E+05	VACUUM VESSEL
72	4	3.16168E+05	VACUUM VESSEL
73	4	3.16168E+05	VACUUM VESSEL
74	4	1.60917E+05	VACUUM VESSEL
75	4	1.12991E+05	VACUUM VESSEL
77	4	4.65957E+04	VACUUM VESSEL
80	4	8.11349E+05	VACUUM VESSEL
81	4	8.11349E+05	VACUUM VESSEL
82	4	7.65630E+05	VACUUM VESSEL
83	4	7.65630E+05	VACUUM VESSEL
84	4	4.20660E+05	VACUUM VESSEL
85	4	4.20660E+05	VACUUM VESSEL
87	4	5.51307E+04	VACUUM VESSEL
90	5	1.20310E+06	TOR.FIELD COILS.INB.
91	5	1.20310E+06	TOR.FIELD COILS.INB.
92	5	4.72845E+05	TOR.FIELD COILS.INB.
93	5	4.72845E+05	TOR.FIELD COILS.INB.
94	5	1.51779E+06	TOR.FIELD COILS.INB.
95	5	1.51779E+06	TOR.FIELD COILS.INB.
100	5	1.02301E+06	POL.FIELD COILS.INB.
101	5	1.02301E+06	POL.FIELD COILS.INB.
106	5	2.40620E+05	POL.FIELD COILS.INB.
107	5	2.40620E+05	POL.FIELD COILS.INB.
120	3	6.97165E+05	FIRST WALL
121	3	4.40918E+05	FIRST WALL
123	3	2.54126E+05	FIRST WALL
124	3	4.81080E+04	FIRST WALL
125	3	3.45292E+04	FIRST WALL
130	6	3.08533E+06	BREEDING BLANKET
131	6	1.91931E+06	BREEDING BLANKET
133	6	1.10972E+06	BREEDING BLANKET
134	6	1.64196E+05	BREEDING BLANKET
135	6	1.16173E+05	BREEDING BLANKET
140	4	1.28351E+06	VACUUM VESSEL
141	4	7.85277E+05	VACUUM VESSEL
143	4	4.54610E+05	VACUUM VESSEL
150	4	1.51154E+06	VACUUM VESSEL
151	4	9.16320E+05	VACUUM VESSEL
153	4	5.30445E+05	VACUUM VESSEL

160	4	3.47997E+06	VACUUM VESSEL
161	4	2.07947E+06	VACUUM VESSEL
163	4	1.20253E+06	VACUUM VESSEL
170	5	2.62822E+06	TOR.FIELD COILS.OUTB
171	5	2.62822E+06	TOR.FIELD COILS.OUTB
200	7	2.38408E+06	BIOL. SHIELD
210	7	4.90659E+06	BIOL. SHIELD
220	7	2.01989E+07	BIOL. SHIELD
230	7	3.32177E+07	BIOL. SHIELD
231	7	9.11369E+06	BIOL. SHIELD
240	7	8.73395E+06	BIOL. SHIELD
250	7	1.81212E+07	BIOL. SHIELD
262	5	2.03122E+05	POL.FIELD COILS.OUTB
272	5	6.64673E+05	POL.FIELD COILS.OUTB
280	5	6.64673E+05	POL.FIELD COILS.OUTB
292	5	2.03122E+05	POL.FIELD COILS.OUTB
330	4	4.76237E+06	EXHAUST PORT
340	4	4.07629E+06	EXHAUST PORT
350	4	6.01643E+05	EXHAUST PORT
360	4	7.02545E+05	EXHAUST PORT
370	4	4.84149E+05	EXHAUST PORT
388	4	9.10495E+05	EXHAUST PORT
389	4	3.02935E+06	EXHAUST PORT

RESUMEE:

TIME= 0.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.593E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	0.000E+00	0.00	0.000E+00
41	FIRST WALL	2.518E+05	0.000E+00	0.00	0.000E+00
42	FIRST WALL	7.777E+04	0.000E+00	0.00	0.000E+00
43	FIRST WALL	7.777E+04	0.000E+00	0.00	0.000E+00
50	INB. BLANKET	5.350E+05	0.000E+00	0.00	0.000E+00
51	INB. BLANKET	5.350E+05	0.000E+00	0.00	0.000E+00
52	INB. BLANKET	3.677E+05	0.000E+00	0.00	0.000E+00
53	INB. BLANKET	3.677E+05	0.000E+00	0.00	0.000E+00
60	VACUUM VESSEL	4.037E+05	0.000E+00	0.00	0.000E+00
61	VACUUM VESSEL	4.037E+05	0.000E+00	0.00	0.000E+00
62	VACUUM VESSEL	2.540E+05	0.000E+00	0.00	0.000E+00
63	VACUUM VESSEL	2.540E+05	0.000E+00	0.00	0.000E+00
64	VACUUM VESSEL	1.237E+05	0.000E+00	0.00	0.000E+00
65	VACUUM VESSEL	8.731E+04	0.000E+00	0.00	0.000E+00
67	VACUUM VESSEL	3.020E+04	0.000E+00	0.00	0.000E+00
70	VACUUM VESSEL	4.514E+05	0.000E+00	0.00	0.000E+00
71	VACUUM VESSEL	4.514E+05	0.000E+00	0.00	0.000E+00
72	VACUUM VESSEL	3.162E+05	0.000E+00	0.00	0.000E+00
73	VACUUM VESSEL	3.162E+05	0.000E+00	0.00	0.000E+00
74	VACUUM VESSEL	1.609E+05	0.000E+00	0.00	0.000E+00
75	VACUUM VESSEL	1.130E+05	0.000E+00	0.00	0.000E+00
77	VACUUM VESSEL	4.670E+04	0.000E+00	0.00	0.000E+00
80	VACUUM VESSEL	8.113E+05	0.000E+00	0.00	0.000E+00
81	VACUUM VESSEL	8.113E+05	0.000E+00	0.00	0.000E+00
82	VACUUM VESSEL	7.656E+05	0.000E+00	0.00	9.404E-05
83	VACUUM VESSEL	7.656E+05	0.000E+00	0.00	6.055E-04
84	VACUUM VESSEL	4.207E+05	0.000E+00	0.00	7.450E-03
85	VACUUM VESSEL	4.207E+05	0.000E+00	0.00	5.204E-04
87	VACUUM VESSEL	5.513E+04	0.000E+00	0.00	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	0.000E+00	0.00	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	0.000E+00	0.00	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	0.000E+00	0.00	2.410E-07
93	TOR.FIELD COILS,	4.728E+05	0.000E+00	0.00	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	0.000E+00	0.00	6.534E-03
95	TOR.FIELD COILS,	1.518E+06	0.000E+00	0.00	5.802E-04
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	2.021E-09
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	0.000E+00	0.00	0.000E+00
121	FIRST WALL	4.409E+05	0.000E+00	0.00	0.000E+00
123	FIRST WALL	2.541E+05	0.000E+00	0.00	0.000E+00
124	FIRST WALL	4.811E+04	0.000E+00	0.00	0.000E+00
125	FIRST WALL	3.453E+04	0.000E+00	0.00	0.000E+00
130	BREEDING BLANKET	3.085E+06	0.000E+00	0.00	0.000E+00
131	BREEDING BLANKET	1.919E+06	0.000E+00	0.00	0.000E+00
133	BREEDING BLANKET	1.110E+06	0.000E+00	0.00	0.000E+00
134	BREEDING BLANKET	1.642E+05	0.000E+00	0.00	0.000E+00
135	BREEDING BLANKET	1.162E+05	0.000E+00	0.00	0.000E+00
140	VACUUM VESSEL	1.284E+06	0.000E+00	0.00	0.000E+00

141	VACUUM VESSEL	7.853E+05	0.000E+00	0.00	0.000E+00
143	VACUUM VESSEL	4.546E+05	0.000E+00	0.00	0.000E+00
150	VACUUM VESSEL	1.512E+06	0.000E+00	0.00	0.000E+00
151	VACUUM VESSEL	9.163E+05	0.000E+00	0.00	0.000E+00
153	VACUUM VESSEL	5.304E+05	0.000E+00	0.00	6.083E-05
160	VACUUM VESSEL	3.480E+06	0.000E+00	0.00	6.823E+01
161	VACUUM VESSEL	2.079E+06	0.000E+00	0.00	2.271E+01
163	VACUUM VESSEL	1.203E+06	0.000E+00	0.00	3.017E+01
170	TOR.FIELD COILS.	2.628E+06	0.000E+00	0.00	1.749E+00
171	TOR.FIELD COILS.	2.628E+06	0.000E+00	0.00	3.204E+00
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	0.000E+00	0.00	3.467E-02
220	BIOL. SHIELD	2.020E+07	0.000E+00	0.00	1.289E+01
230	BIOL. SHIELD	3.322E+07	0.000E+00	0.00	3.496E+01
231	BIOL. SHIELD	9.114E+06	0.000E+00	0.00	2.026E-05
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	0.000E+00	0.00	2.551E-02
262	POL.FIELD COILS.	2.031E+05	0.000E+00	0.00	9.047E-05
272	POL.FIELD COILS.	6.647E+05	0.000E+00	0.00	3.138E+00
280	POL.FIELD COILS.	6.647E+05	0.000E+00	0.00	3.887E-01
292	POL.FIELD COILS.	2.031E+05	0.000E+00	0.00	9.357E-05
330	EXHAUST PORT	4.762E+06	0.000E+00	0.00	3.177E-03
340	EXHAUST PORT	4.076E+06	0.000E+00	0.00	7.111E-01
350	EXHAUST PORT	6.016E+05	0.000E+00	0.00	1.035E-03
360	EXHAUST PORT	7.025E+05	0.000E+00	0.00	8.466E-01
370	EXHAUST PORT	4.841E+05	0.000E+00	0.00	2.497E+00
388	EXHAUST PORT	9.105E+05	0.000E+00	0.00	1.825E-01
389	EXHAUST PORT	3.029E+06	0.000E+00	0.00	3.212E-02
TOTAL					1.818E+02

TIME= 90.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.508E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	2.598E+11	0.80	0.000E+00
41	FIRST WALL	2.518E+05	2.440E+11	0.80	0.000E+00
42	FIRST WALL	7.777E+04	1.647E+11	0.80	0.000E+00
43	FIRST WALL	7.777E+04	1.673E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	1.633E+10	0.58	0.000E+00
51	INB. BLANKET	5.350E+05	1.637E+10	0.58	0.000E+00
52	INB. BLANKET	3.677E+05	9.354E+09	0.58	0.000E+00
53	INB. BLANKET	3.677E+05	8.598E+09	0.58	0.000E+00
60	VACUUM VESSEL	4.037E+05	9.757E+09	0.89	0.000E+00
61	VACUUM VESSEL	4.037E+05	9.241E+09	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	4.259E+09	0.88	0.000E+00
63	VACUUM VESSEL	2.540E+05	6.512E+09	0.88	0.000E+00
64	VACUUM VESSEL	1.237E+05	4.711E+09	0.89	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.009E+10	0.89	0.000E+00
67	VACUUM VESSEL	3.020E+04	4.585E+10	0.86	0.000E+00
70	VACUUM VESSEL	4.514E+05	5.868E+09	0.81	0.000E+00
71	VACUUM VESSEL	4.514E+05	5.604E+09	0.81	0.000E+00
72	VACUUM VESSEL	3.162E+05	2.587E+09	0.80	0.000E+00
73	VACUUM VESSEL	3.162E+05	3.783E+09	0.81	0.000E+00
74	VACUUM VESSEL	1.609E+05	2.581E+09	0.81	0.000E+00
75	VACUUM VESSEL	1.130E+05	5.507E+09	0.83	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.056E+10	0.83	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.681E+09	0.78	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.712E+09	0.78	0.000E+00
82	VACUUM VESSEL	7.656E+05	5.741E+08	0.78	9.420E-05
83	VACUUM VESSEL	7.656E+05	9.355E+08	0.78	6.186E-04
84	VACUUM VESSEL	4.207E+05	5.710E+08	0.78	8.200E-03
85	VACUUM VESSEL	4.207E+05	1.899E+09	0.79	5.270E-04
87	VACUUM VESSEL	5.513E+04	3.785E+09	0.84	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	2.799E+08	1.56	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	3.061E+08	1.56	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	1.742E+07	1.56	2.410E-07
93	TOR.FIELD COILS,	4.728E+05	3.473E+07	1.56	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	7.088E+07	1.56	6.543E-03
95	TOR.FIELD COILS,	1.518E+06	2.098E+08	1.56	5.804E-04
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	3.442E+02	0.25	2.021E-09
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.375E+12	0.80	0.000E+00
121	FIRST WALL	4.409E+05	2.577E+11	0.80	0.000E+00
123	FIRST WALL	2.541E+05	2.611E+11	0.80	0.000E+00
124	FIRST WALL	4.811E+04	1.722E+11	0.79	0.000E+00
125	FIRST WALL	3.453E+04	1.570E+11	0.79	0.000E+00
130	BREEDING BLANKET	3.085E+06	1.934E+10	0.58	0.000E+00
131	BREEDING BLANKET	1.919E+06	8.482E+09	0.58	0.000E+00
133	BREEDING BLANKET	1.110E+06	8.829E+09	0.58	0.000E+00
134	BREEDING BLANKET	1.642E+05	7.400E+09	0.58	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.230E+10	0.58	0.000E+00
140	VACUUM VESSEL	1.284E+06	4.314E+09	0.87	0.000E+00
141	VACUUM VESSEL	7.853E+05	2.299E+09	0.88	0.000E+00
143	VACUUM VESSEL	4.546E+05	2.552E+09	0.88	0.000E+00

150	VACUUM VESSEL	1.512E+06	2.678E+[illegible]	0.80	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.553E+09	0.81	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.554E+09	0.80	6.868E-05
160	VACUUM VESSEL	3.480E+06	4.961E+08	0.78	7.840E+01
161	VACUUM VESSEL	2.079E+06	4.303E+08	0.79	2.494E+01
163	VACUUM VESSEL	1.203E+06	3.757E+08	0.78	3.395E+01
170	TOR.FIELD COILS.	2.628E+06	3.614E+07	1.55	1.752E+00
171	TOR.FIELD COILS.	2.628E+06	7.911E+07	1.55	3.210E+00
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.311E+06	2.27	3.572E-02
220	BIOL. SHIELD	2.020E+07	4.077E+06	2.28	1.325E+01
230	BIOL. SHIELD	3.322E+07	3.796E+06	2.28	3.597E+01
231	BIOL. SHIELD	9.114E+06	4.178E+02	0.00	2.026E-05
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	3.569E+05	2.28	2.625E-02
262	POL.FIELD COILS.	2.031E+05	1.431E+07	1.56	9.052E-05
272	POL.FIELD COILS.	6.647E+05	2.251E+08	1.55	3.143E+00
280	POL.FIELD COILS.	6.647E+05	3.025E+07	1.53	3.891E-01
292	POL.FIELD COILS.	2.031E+05	5.142E+07	1.55	9.357E-05
330	EXHAUST PORT	4.762E+06	1.773E+06	0.77	4.136E-03
340	EXHAUST PORT	4.076E+06	3.803E+06	0.80	7.684E-01
350	EXHAUST PORT	6.016E+05	1.633E+08	0.79	1.077E-03
360	EXHAUST PORT	7.025E+05	2.357E+08	0.79	9.599E-01
370	EXHAUST PORT	4.841E+05	6.247E+07	0.85	2.592E+00
388	EXHAUST PORT	9.105E+05	1.406E+08	0.78	2.084E-01
389	EXHAUST PORT	3.029E+06	7.095E+06	0.76	4.356E-02
TOTAL					1.997E+02

TIME= 180.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.428E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	3.272E+11	0.81	0.000E+00
41	FIRST WALL	2.518E+05	3.072E+11	0.81	0.000E+00
42	FIRST WALL	7.777E+04	2.081E+11	0.81	0.000E+00
43	FIRST WALL	7.777E+04	2.108E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	2.102E+10	0.58	0.000E+00
51	INB. BLANKET	5.350E+05	2.121E+10	0.58	0.000E+00
52	INB. BLANKET	3.677E+05	1.196E+10	0.58	0.000E+00
53	INB. BLANKET	3.677E+05	1.145E+10	0.58	0.000E+00
60	VACUUM VESSEL	4.037E+05	1.210E+10	0.89	0.000E+00
61	VACUUM VESSEL	4.037E+05	1.148E+10	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	5.271E+09	0.87	0.000E+00
63	VACUUM VESSEL	2.540E+05	8.080E+09	0.88	0.000E+00
64	VACUUM VESSEL	1.237E+05	5.849E+09	0.89	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.255E+10	0.89	0.000E+00
67	VACUUM VESSEL	3.020E+04	5.710E+10	0.87	0.000E+00
70	VACUUM VESSEL	4.514E+05	7.202E+09	0.81	0.000E+00
71	VACUUM VESSEL	4.514E+05	6.879E+09	0.81	0.000E+00
72	VACUUM VESSEL	3.162E+05	3.172E+09	0.80	0.000E+00
73	VACUUM VESSEL	3.162E+05	4.647E+09	0.81	0.000E+00
74	VACUUM VESSEL	1.609E+05	3.166E+09	0.81	0.000E+00
75	VACUUM VESSEL	1.130E+05	6.771E+09	0.82	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.305E+10	0.83	0.000E+00
80	VACUUM VESSEL	8.113E+05	2.060E+09	0.78	0.000E+00
81	VACUUM VESSEL	8.113E+05	2.099E+09	0.78	0.000E+00
82	VACUUM VESSEL	7.656E+05	7.032E+08	0.78	9.422E-05
83	VACUUM VESSEL	7.656E+05	1.147E+09	0.78	6.211E-04
84	VACUUM VESSEL	4.207E+05	6.998E+08	0.78	8.504E-03
85	VACUUM VESSEL	4.207E+05	2.330E+09	0.79	5.297E-04
87	VACUUM VESSEL	5.513E+04	4.678E+09	0.84	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	3.500E+08	1.53	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	3.828E+08	1.53	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	2.191E+07	1.53	2.410E-07
93	TOR.FIELD COILS,	4.728E+05	4.369E+07	1.53	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	8.846E+07	1.53	6.546E-03
95	TOR.FIELD COILS,	1.518E+06	2.615E+08	1.54	5.805E-04
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	4.239E+02	0.25	2.021E-09
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.689E+12	0.80	0.000E+00
121	FIRST WALL	4.409E+05	3.239E+11	0.80	0.000E+00
123	FIRST WALL	2.541E+05	3.283E+11	0.80	0.000E+00
124	FIRST WALL	4.811E+04	2.185E+11	0.79	0.000E+00
125	FIRST WALL	3.453E+04	1.992E+11	0.80	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.598E+10	0.59	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.153E+10	0.59	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.203E+10	0.59	0.000E+00
134	BREEDING BLANKET	1.642E+05	9.484E+09	0.58	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.556E+10	0.58	0.000E+00
140	VACUUM VESSEL	1.284E+06	5.307E+09	0.86	0.000E+00
141	VACUUM VESSEL	7.853E+05	2.834E+09	0.88	0.000E+00
143	VACUUM VESSEL	4.546E+05	3.142E+09	0.87	0.000E+00

150	VACUUM VESSEL	1.512E+06	3.284E+09	0.79	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.905E+09	0.80	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.906E+09	0.80	7.183E-05
160	VACUUM VESSEL	3.480E+06	6.078E+08	0.77	8.248E+01
161	VACUUM VESSEL	2.079E+06	5.275E+08	0.79	2.580E+01
163	VACUUM VESSEL	1.203E+06	4.605E+08	0.78	3.543E+01
170	TOR.FIELD COILS.	2.628E+06	4.533E+07	1.53	1.753E+00
171	TOR.FIELD COILS.	2.628E+06	9.931E+07	1.52	3.211E+00
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.327E+06	2.27	3.572E-02
220	BIOL. SHIELD	2.020E+07	4.128E+06	2.28	1.325E+01
230	BIOL. SHIELD	3.322E+07	3.839E+06	2.28	3.597E+01
231	BIOL. SHIELD	9.114E+06	4.298E+02	0.00	2.026E-05
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	3.612E+05	2.28	2.625E-02
262	POL.FIELD COILS.	2.031E+05	1.792E+07	1.54	9.054E-05
272	POL.FIELD COILS.	6.647E+05	2.820E+08	1.53	3.144E+00
280	POL.FIELD COILS.	6.647E+05	3.762E+07	1.51	3.892E-01
292	POL.FIELD COILS.	2.031E+05	6.388E+07	1.53	9.357E-05
330	EXHAUST PORT	4.762E+06	2.166E+06	0.77	4.532E-03
340	EXHAUST PORT	4.076E+06	4.648E+06	0.79	7.899E-01
350	EXHAUST PORT	6.016E+05	1.998E+08	0.79	1.088E-03
360	EXHAUST PORT	7.025E+05	2.901E+08	0.79	1.005E+00
370	EXHAUST PORT	4.841E+05	7.673E+07	0.84	2.622E+00
388	EXHAUST PORT	9.105E+05	1.726E+08	0.77	2.189E-01
389	EXHAUST PORT	3.029E+06	8.712E+06	0.76	4.836E-02
TOTAL					2.062E+02

TIME= 270.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.349E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	3.678E+11	0.81	0.000E+00
41	FIRST WALL	2.518E+05	3.454E+11	0.81	0.000E+00
42	FIRST WALL	7.777E+04	2.348E+11	0.81	0.000E+00
43	FIRST WALL	7.777E+04	2.373E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	2.527E+10	0.58	0.000E+00
51	INB. BLANKET	5.350E+05	2.557E+10	0.59	0.000E+00
52	INB. BLANKET	3.677E+05	1.436E+10	0.58	0.000E+00
53	INB. BLANKET	3.677E+05	1.409E+10	0.59	0.000E+00
60	VACUUM VESSEL	4.037E+05	1.344E+10	0.89	0.000E+00
61	VACUUM VESSEL	4.037E+05	1.277E+10	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	5.838E+09	0.88	0.000E+00
63	VACUUM VESSEL	2.540E+05	8.988E+09	0.89	0.000E+00
64	VACUUM VESSEL	1.237E+05	6.492E+09	0.89	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.397E+10	0.89	0.000E+00
67	VACUUM VESSEL	3.020E+04	6.375E+10	0.87	0.000E+00
70	VACUUM VESSEL	4.514E+05	7.876E+09	0.81	0.000E+00
71	VACUUM VESSEL	4.514E+05	7.523E+09	0.81	0.000E+00
72	VACUUM VESSEL	3.162E+05	3.462E+09	0.80	0.000E+00
73	VACUUM VESSEL	3.162E+05	5.086E+09	0.81	0.000E+00
74	VACUUM VESSEL	1.609E+05	3.462E+09	0.81	0.000E+00
75	VACUUM VESSEL	1.130E+05	7.427E+09	0.82	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.437E+10	0.83	0.000E+00
80	VACUUM VESSEL	8.113E+05	2.243E+09	0.78	0.000E+00
81	VACUUM VESSEL	8.113E+05	2.285E+09	0.78	0.000E+00
82	VACUUM VESSEL	7.656E+05	7.654E+08	0.78	9.424E-05
83	VACUUM VESSEL	7.656E+05	1.249E+09	0.78	6.226E-04
84	VACUUM VESSEL	4.207E+05	7.626E+08	0.78	8.638E-03
85	VACUUM VESSEL	4.207E+05	2.541E+09	0.79	5.309E-04
87	VACUUM VESSEL	5.513E+04	5.162E+09	0.84	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	3.802E+08	1.52	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	4.160E+08	1.52	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	2.386E+07	1.52	2.410E-07
93	TOR.FIELD COILS,	4.728E+05	4.755E+07	1.52	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	9.607E+07	1.52	6.549E-03
95	TOR.FIELD COILS,	1.518E+06	2.838E+08	1.53	5.805E-04
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	4.587E+02	0.25	2.021E-09
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.857E+12	0.79	0.000E+00
121	FIRST WALL	4.409E+05	3.643E+11	0.80	0.000E+00
123	FIRST WALL	2.541E+05	3.693E+11	0.80	0.000E+00
124	FIRST WALL	4.811E+04	2.467E+11	0.79	0.000E+00
125	FIRST WALL	3.453E+04	2.247E+11	0.80	0.000E+00
130	BREEDING BLANKET	3.085E+06	3.185E+10	0.59	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.435E+10	0.59	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.498E+10	0.59	0.000E+00
134	BREEDING BLANKET	1.642E+05	1.142E+10	0.58	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.856E+10	0.58	0.000E+00
140	VACUUM VESSEL	1.284E+06	5.852E+09	0.86	0.000E+00
141	VACUUM VESSEL	7.853E+05	3.136E+09	0.88	0.000E+00
143	VACUUM VESSEL	4.546E+05	3.474E+09	0.87	0.000E+00

150	VACUUM VESSEL	1.512E+06	3.584E+09	0.79	0.000E+00
151	VACUUM VESSEL	9.163E+05	2.083E+09	0.80	0.000E+00
153	VACUUM VESSEL	5.304E+05	2.083E+09	0.80	7.322E-05
160	VACUUM VESSEL	3.480E+06	6.613E+08	0.77	8.429E+01
161	VACUUM VESSEL	2.079E+06	5.751E+08	0.79	2.619E+01
163	VACUUM VESSEL	1.203E+06	5.015E+08	0.78	3.610E+01
170	TOR.FIELD COILS.	2.628E+06	4.928E+07	1.52	1.754E+00
171	TOR.FIELD COILS.	2.628E+06	1.080E+08	1.51	3.212E+00
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.328E+06	2.27	3.572E-02
220	BIOL. SHIELD	2.020E+07	4.130E+06	2.28	1.325E+01
230	BIOL. SHIELD	3.322E+07	3.841E+06	2.28	3.597E+01
231	BIOL. SHIELD	9.114E+06	4.301E+02	0.00	2.026E-05
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	3.613E+05	2.28	2.625E-02
262	POL.FIELD COILS.	2.031E+05	1.947E+07	1.52	9.055E-05
272	POL.FIELD COILS.	6.647E+05	3.064E+08	1.52	3.145E+00
280	POL.FIELD COILS.	6.647E+05	4.080E+07	1.50	3.893E-01
292	POL.FIELD COILS.	2.031E+05	6.929E+07	1.52	9.357E-05
330	EXHAUST PORT	4.762E+06	2.346E+06	0.77	4.707E-03
340	EXHAUST PORT	4.076E+06	5.060E+06	0.79	7.996E-01
350	EXHAUST PORT	6.016E+05	2.173E+08	0.79	1.094E-03
360	EXHAUST PORT	7.025E+05	3.166E+08	0.79	1.026E+00
370	EXHAUST PORT	4.841E+05	8.438E+07	0.85	2.637E+00
388	EXHAUST PORT	9.105E+05	1.881E+08	0.77	2.235E-01
389	EXHAUST PORT	3.029E+06	9.475E+06	0.76	5.050E-02
TOTAL					2.091E+02

TIME= 360.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.272E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	3.948E+11	0.81	0.000E+00
41	FIRST WALL	2.518E+05	3.708E+11	0.81	0.000E+00
42	FIRST WALL	7.777E+04	2.528E+11	0.81	0.000E+00
43	FIRST WALL	7.777E+04	2.552E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	2.915E+10	0.59	0.000E+00
51	INB. BLANKET	5.350E+05	2.954E+10	0.59	0.000E+00
52	INB. BLANKET	3.677E+05	1.661E+10	0.58	0.000E+00
53	INB. BLANKET	3.677E+05	1.655E+10	0.59	0.000E+00
60	VACUUM VESSEL	4.037E+05	1.427E+10	0.90	0.000E+00
61	VACUUM VESSEL	4.037E+05	1.358E+10	0.91	0.000E+00
62	VACUUM VESSEL	2.540E+05	6.185E+09	0.88	0.000E+00
63	VACUUM VESSEL	2.540E+05	9.564E+09	0.89	0.000E+00
64	VACUUM VESSEL	1.237E+05	6.888E+09	0.89	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.485E+10	0.89	0.000E+00
67	VACUUM VESSEL	3.020E+04	6.806E+10	0.87	0.000E+00
70	VACUUM VESSEL	4.514E+05	8.249E+09	0.81	0.000E+00
71	VACUUM VESSEL	4.514E+05	7.878E+09	0.81	0.000E+00
72	VACUUM VESSEL	3.162E+05	3.618E+09	0.80	0.000E+00
73	VACUUM VESSEL	3.162E+05	5.331E+09	0.81	0.000E+00
74	VACUUM VESSEL	1.609E+05	3.627E+09	0.81	0.000E+00
75	VACUUM VESSEL	1.130E+05	7.800E+09	0.82	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.515E+10	0.83	0.000E+00
80	VACUUM VESSEL	8.113E+05	2.339E+09	0.78	0.000E+00
81	VACUUM VESSEL	8.113E+05	2.383E+09	0.78	0.000E+00
82	VACUUM VESSEL	7.656E+05	7.978E+08	0.78	9.425E-05
83	VACUUM VESSEL	7.656E+05	1.302E+09	0.78	6.234E-04
84	VACUUM VESSEL	4.207E+05	7.959E+08	0.78	8.699E-03
85	VACUUM VESSEL	4.207E+05	2.654E+09	0.79	5.315E-04
87	VACUUM VESSEL	5.513E+04	5.451E+09	0.84	0.000E+00
90	TOR.FIELD COILS.	1.203E+06	3.935E+08	1.52	0.000E+00
91	TOR.FIELD COILS.	1.203E+06	4.304E+08	1.52	0.000E+00
92	TOR.FIELD COILS.	4.728E+05	2.471E+07	1.52	2.410E-07
93	TOR.FIELD COILS.	4.728E+05	4.923E+07	1.52	0.000E+00
94	TOR.FIELD COILS.	1.518E+06	9.939E+07	1.52	6.551E-03
95	TOR.FIELD COILS.	1.518E+06	2.936E+08	1.52	5.805E-04
100	POL.FIELD COILS.	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS.	1.023E+06	4.740E+02	0.25	2.021E-09
106	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.954E+12	0.79	0.000E+00
121	FIRST WALL	4.409E+05	3.913E+11	0.80	0.000E+00
123	FIRST WALL	2.541E+05	3.968E+11	0.80	0.000E+00
124	FIRST WALL	4.811E+04	2.656E+11	0.79	0.000E+00
125	FIRST WALL	3.453E+04	2.419E+11	0.80	0.000E+00
130	BREEDING BLANKET	3.085E+06	3.709E+10	0.59	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.696E+10	0.59	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.771E+10	0.59	0.000E+00
134	BREEDING BLANKET	1.642E+05	1.325E+10	0.58	0.000E+00
135	BREEDING BLANKET	1.162E+05	2.135E+10	0.58	0.000E+00
140	VACUUM VESSEL	1.284E+06	6.180E+09	0.86	0.000E+00
141	VACUUM VESSEL	7.853E+05	3.323E+09	0.88	0.000E+00
143	VACUUM VESSEL	4.546E+05	3.680E+09	0.87	0.000E+00

150	VACUUM VESSEL	1.512E+06	3.746E+09	0.79	0.000E+00
151	VACUUM VESSEL	9.163E+05	2.180E+09	0.80	0.000E+00
153	VACUUM VESSEL	5.304E+05	2.181E+09	0.80	7.384E-05
160	VACUUM VESSEL	3.480E+06	6.890E+08	0.77	8.513E+01
161	VACUUM VESSEL	2.079E+06	6.004E+08	0.79	2.637E+01
163	VACUUM VESSEL	1.203E+06	5.230E+08	0.78	3.640E+01
170	TOR.FIELD COILS.	2.628E+06	5.101E+07	1.51	1.754E+00
171	TOR.FIELD COILS.	2.628E+06	1.118E+08	1.51	3.213E+00
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.328E+06	2.27	3.572E-02
220	BIOL. SHIELD	2.020E+07	4.131E+06	2.28	1.325E+01
230	BIOL. SHIELD	3.322E+07	3.842E+06	2.28	3.597E+01
231	BIOL. SHIELD	9.114E+06	4.301E+02	0.00	2.026E-05
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	3.614E+05	2.28	2.625E-02
262	POL.FIELD COILS.	2.031E+05	2.014E+07	1.52	9.056E-05
272	POL.FIELD COILS.	6.647E+05	3.170E+08	1.51	3.146E+00
280	POL.FIELD COILS.	6.647E+05	4.218E+07	1.49	3.893E-01
292	POL.FIELD COILS.	2.031E+05	7.165E+07	1.51	9.357E-05
330	EXHAUST PORT	4.762E+06	2.435E+06	0.77	4.787E-03
340	EXHAUST PORT	4.076E+06	5.276E+06	0.79	8.041E-01
350	EXHAUST PORT	6.016E+05	2.263E+08	0.79	1.098E-03
360	EXHAUST PORT	7.025E+05	3.304E+08	0.79	1.035E+00
370	EXHAUST PORT	4.841E+05	8.888E+07	0.85	2.644E+00
388	EXHAUST PORT	9.105E+05	1.961E+08	0.77	2.257E-01
389	EXHAUST PORT	3.029E+06	9.863E+06	0.76	5.148E-02
TOTAL					2.105E+02

TIME= 361.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.271E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	3.281E+11	0.80	0.000E+00
41	FIRST WALL	2.518E+05	3.087E+11	0.80	0.000E+00
42	FIRST WALL	7.777E+04	2.102E+11	0.80	0.000E+00
43	FIRST WALL	7.777E+04	2.109E+11	0.79	0.000E+00
50	INB. BLANKET	5.350E+05	1.850E+10	0.99	0.000E+00
51	INB. BLANKET	5.350E+05	1.903E+10	1.00	0.000E+00
52	INB. BLANKET	3.677E+05	1.033E+10	0.99	0.000E+00
53	INB. BLANKET	3.677E+05	1.132E+10	0.99	0.000E+00
60	VACUUM VESSEL	4.037E+05	1.042E+10	0.88	0.000E+00
61	VACUUM VESSEL	4.037E+05	9.994E+09	0.89	0.000E+00
62	VACUUM VESSEL	2.540E+05	4.532E+09	0.86	0.000E+00
63	VACUUM VESSEL	2.540E+05	7.178E+09	0.88	0.000E+00
64	VACUUM VESSEL	1.237E+05	5.081E+09	0.88	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.116E+10	0.88	0.000E+00
67	VACUUM VESSEL	3.020E+04	5.446E+10	0.86	0.000E+00
70	VACUUM VESSEL	4.514E+05	5.773E+09	0.79	0.000E+00
71	VACUUM VESSEL	4.514E+05	5.520E+09	0.79	0.000E+00
72	VACUUM VESSEL	3.162E+05	2.526E+09	0.78	0.000E+00
73	VACUUM VESSEL	3.162E+05	3.751E+09	0.79	0.000E+00
74	VACUUM VESSEL	1.609E+05	2.545E+09	0.79	0.000E+00
75	VACUUM VESSEL	1.130E+05	5.521E+09	0.81	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.096E+10	0.81	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.628E+09	0.77	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.660E+09	0.77	0.000E+00
82	VACUUM VESSEL	7.656E+05	5.551E+08	0.77	1.255E-07
83	VACUUM VESSEL	7.656E+05	9.070E+08	0.77	1.083E-05
84	VACUUM VESSEL	4.207E+05	5.556E+08	0.77	1.196E-03
85	VACUUM VESSEL	4.207E+05	1.854E+09	0.77	1.069E-05
87	VACUUM VESSEL	5.513E+04	4.030E+09	0.83	0.000E+00
90	TOR.FIELD COILS.	1.203E+06	2.740E+08	1.44	0.000E+00
91	TOR.FIELD COILS.	1.203E+06	3.002E+08	1.44	0.000E+00
92	TOR.FIELD COILS.	4.728E+05	1.764E+07	1.45	8.510E-44
93	TOR.FIELD COILS.	4.728E+05	3.515E+07	1.44	0.000E+00
94	TOR.FIELD COILS.	1.518E+06	6.875E+07	1.44	1.158E-05
95	TOR.FIELD COILS.	1.518E+06	2.018E+08	1.46	3.383E-08
100	POL.FIELD COILS.	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS.	1.023E+06	3.098E+02	0.25	5.064E-16
106	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.601E+12	0.77	0.000E+00
121	FIRST WALL	4.409E+05	3.262E+11	0.79	0.000E+00
123	FIRST WALL	2.541E+05	3.304E+11	0.79	0.000E+00
124	FIRST WALL	4.811E+04	2.188E+11	0.78	0.000E+00
125	FIRST WALL	3.453E+04	1.988E+11	0.79	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.593E+10	0.99	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.209E+10	1.00	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.268E+10	1.00	0.000E+00
134	BREEDING BLANKET	1.642E+05	8.294E+09	0.98	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.289E+10	0.98	0.000E+00
140	VACUUM VESSEL	1.284E+06	4.374E+09	0.84	0.000E+00
141	VACUUM VESSEL	7.853E+05	2.368E+09	0.86	0.000E+00
143	VACUUM VESSEL	4.546E+05	2.616E+09	0.85	0.000E+00

150	VACUUM VESSEL	1.512E+06	2.614E+09	0.78	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.523E+09	0.79	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.525E+09	0.78	1.262E-05
160	VACUUM VESSEL	3.400E+06	4.794E+00	0.76	1.604E+01
161	VACUUM VESSEL	2.079E+06	4.183E+00	0.77	3.304E+00
163	VACUUM VESSEL	1.203E+06	3.643E+00	0.77	5.859E+00
170	TOR.FIELD COILS.	2.620E+06	3.600E+07	1.43	3.237E-03
171	TOR.FIELD COILS.	2.620E+06	7.919E+07	1.42	5.782E-03
200	BIOL. SHIELD	2.304E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	7.677E+05	2.25	3.221E-04
220	BIOL. SHIELD	2.020E+07	2.421E+06	2.25	1.000E-01
230	BIOL. SHIELD	3.324E+07	2.131E+06	2.25	3.050E-01
231	BIOL. SHIELD	9.114E+06	4.135E+02	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	2.075E+05	2.25	2.239E-04
262	POL.FIELD COILS.	2.031E+05	1.412E+07	1.43	5.981E-08
272	POL.FIELD COILS.	6.647E+05	2.226E+00	1.42	5.501E-03
280	POL.FIELD COILS.	6.647E+05	2.875E+07	1.37	3.660E-04
292	POL.FIELD COILS.	2.831E+05	4.863E+07	1.45	2.788E-12
330	EXHAUST PORT	4.762E+06	1.677E+06	0.76	1.555E-03
340	EXHAUST PORT	4.076E+06	3.659E+06	0.78	8.475E-02
350	EXHAUST PORT	6.016E+05	1.560E+08	0.78	4.705E-05
360	EXHAUST PORT	7.025E+05	2.325E+08	0.78	1.776E-01
370	EXHAUST PORT	4.841E+05	6.206E+07	0.83	1.217E-01
388	EXHAUST PORT	9.105E+05	1.370E+08	0.77	4.118E-02
389	EXHAUST PORT	3.029E+06	6.892E+06	0.76	1.887E-02
TOTAL					2.616E+01

TIME= 365.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/E
10	PLASMA	1.882E+07	3.267E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	3.009E+11	0.80	0.000E+00
41	FIRST WALL	2.518E+05	2.832E+11	0.80	0.000E+00
42	FIRST WALL	7.777E+04	1.930E+11	0.80	0.000E+00
43	FIRST WALL	7.777E+04	1.933E+11	0.79	0.000E+00
50	INB. BLANKET	5.350E+05	1.835E+10	1.00	0.000E+00
51	INB. BLANKET	5.350E+05	1.800E+10	1.01	0.000E+00
52	INB. BLANKET	3.677E+05	1.025E+10	1.00	0.000E+00
53	INB. BLANKET	3.677E+05	1.123E+10	1.00	0.000E+00
60	VACUUM VESSEL	4.037E+05	9.517E+09	0.88	0.000E+00
61	VACUUM VESSEL	4.037E+05	9.140E+09	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	4.121E+09	0.86	0.000E+00
63	VACUUM VESSEL	2.540E+05	6.540E+09	0.88	0.000E+00
64	VACUUM VESSEL	1.237E+05	4.633E+09	0.88	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.019E+10	0.88	0.000E+00
67	VACUUM VESSEL	3.020E+04	4.971E+10	0.86	0.000E+00
70	VACUUM VESSEL	4.514E+05	5.175E+09	0.79	0.000E+00
71	VACUUM VESSEL	4.514E+05	4.949E+09	0.79	0.000E+00
72	VACUUM VESSEL	3.162E+05	2.259E+09	0.78	0.000E+00
73	VACUUM VESSEL	3.162E+05	3.365E+09	0.79	0.000E+00
74	VACUUM VESSEL	1.609E+05	2.281E+09	0.79	0.000E+00
75	VACUUM VESSEL	1.130E+05	4.966E+09	0.80	0.000E+00
77	VACUUM VESSEL	4.670E+04	9.892E+09	0.81	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.451E+09	0.77	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.480E+09	0.77	0.000E+00
82	VACUUM VESSEL	7.656E+05	4.947E+08	0.77	1.117E-07
83	VACUUM VESSEL	7.656E+05	8.090E+08	0.77	1.723E-06
84	VACUUM VESSEL	4.207E+05	4.957E+08	0.77	1.148E-03
85	VACUUM VESSEL	4.207E+05	1.656E+09	0.77	1.027E-05
87	VACUUM VESSEL	5.513E+04	3.645E+09	0.82	0.000E+00
90	TOR.FIELD COILS.	1.203E+06	2.639E+08	1.44	0.000E+00
91	TOR.FIELD COILS.	1.203E+06	2.891E+08	1.45	0.000E+00
92	TOR.FIELD COILS.	4.728E+05	1.699E+07	1.46	0.000E+00
93	TOR.FIELD COILS.	4.728E+05	3.385E+07	1.44	0.000E+00
94	TOR.FIELD COILS.	1.518E+06	6.622E+07	1.45	1.151E-05
95	TOR.FIELD COILS.	1.518E+06	1.964E+08	1.46	3.276E-08
100	POL.FIELD COILS.	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS.	1.023E+06	2.986E+02	0.25	4.837E-16
106	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS.	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.463E+12	0.78	0.000E+00
121	FIRST WALL	4.409E+05	2.990E+11	0.79	0.000E+00
123	FIRST WALL	2.541E+05	3.030E+11	0.79	0.000E+00
124	FIRST WALL	4.811E+04	2.011E+11	0.78	0.000E+00
125	FIRST WALL	3.453E+04	1.826E+11	0.79	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.573E+10	1.01	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.200E+10	1.01	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.258E+10	1.01	0.000E+00
134	BREEDING BLANKET	1.642E+05	8.228E+09	0.99	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.280E+10	0.99	0.000E+00
140	VACUUM VESSEL	1.284E+06	3.962E+09	0.84	0.000E+00
141	VACUUM VESSEL	7.853E+05	2.154E+09	0.86	0.000E+00
143	VACUUM VESSEL	4.546E+05	2.377E+09	0.85	0.000E+00

150	VACUUM VESSEL	1.512E+06	2.337E+09	0.78	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.365E+09	0.79	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.365E+09	0.78	1.193E-05
160	VACUUM VESSEL	3.480E+06	4.270E+08	0.76	1.539E+01
161	VACUUM VESSEL	2.079E+06	3.736E+08	0.77	3.238E+00
163	VACUUM VESSEL	1.203E+06	3.248E+08	0.77	5.617E+00
170	TOR.FIELD COILS.	2.628E+06	3.467E+07	1.44	3.210E-03
171	TOR.FIELD COILS.	2.628E+06	7.626E+07	1.42	5.725E-03
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	4.649E+05	2.25	3.816E-06
220	BIOL. SHIELD	2.020E+07	1.504E+06	2.25	1.280E-03
230	BIOL. SHIELD	3.322E+07	1.253E+06	2.25	3.624E-03
231	BIOL. SHIELD	9.114E+06	3.530E+02	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	1.257E+05	2.25	2.653E-06
262	POL.FIELD COILS.	2.031E+05	1.359E+07	1.44	5.938E-08
272	POL.FIELD COILS.	6.647E+05	2.144E+08	1.42	5.446E-03
280	POL.FIELD COILS.	6.647E+05	2.769E+07	1.38	3.607E-04
292	POL.FIELD COILS.	2.031E+05	4.685E+07	1.45	2.629E-12
330	EXHAUST PORT	4.762E+06	1.487E+06	0.76	1.495E-03
340	EXHAUST PORT	4.076E+06	3.266E+06	0.78	8.100E-02
350	EXHAUST PORT	6.016E+05	1.398E+08	0.78	4.398E-05
360	EXHAUST PORT	7.025E+05	2.081E+08	0.78	1.703E-01
370	EXHAUST PORT	4.841E+05	5.611E+07	0.83	1.151E-01
388	EXHAUST PORT	9.105E+05	1.224E+08	0.77	3.953E-02
389	EXHAUST PORT	3.029E+06	6.139E+06	0.76	1.816E-02
TOTAL					2.470E+01

TIME= 370.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.262E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	2.822E+11	0.80	0.000E+00
41	FIRST WALL	2.518E+05	2.654E+11	0.80	0.000E+00
42	FIRST WALL	7.777E+04	1.811E+11	0.80	0.000E+00
43	FIRST WALL	7.777E+04	1.814E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	1.822E+10	1.01	0.000E+00
51	INB. BLANKET	5.350E+05	1.875E+10	1.01	0.000E+00
52	INB. BLANKET	3.677E+05	1.018E+10	1.01	0.000E+00
53	INB. BLANKET	3.677E+05	1.116E+10	1.01	0.000E+00
60	VACUUM VESSEL	4.037E+05	9.034E+09	0.89	0.000E+00
61	VACUUM VESSEL	4.037E+05	8.670E+09	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	3.909E+09	0.86	0.000E+00
63	VACUUM VESSEL	2.540E+05	6.190E+09	0.88	0.000E+00
64	VACUUM VESSEL	1.237E+05	4.394E+09	0.88	0.000E+00
65	VACUUM VESSEL	8.731E+04	9.640E+09	0.88	0.000E+00
67	VACUUM VESSEL	3.020E+04	4.656E+10	0.86	0.000E+00
70	VACUUM VESSEL	4.514E+05	4.938E+09	0.79	0.000E+00
71	VACUUM VESSEL	4.514E+05	4.721E+09	0.79	0.000E+00
72	VACUUM VESSEL	3.162E+05	2.156E+09	0.78	0.000E+00
73	VACUUM VESSEL	3.162E+05	3.209E+09	0.79	0.000E+00
74	VACUUM VESSEL	1.609E+05	2.175E+09	0.79	0.000E+00
75	VACUUM VESSEL	1.130E+05	4.731E+09	0.80	0.000E+00
77	VACUUM VESSEL	4.670E+04	9.412E+09	0.81	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.386E+09	0.77	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.413E+09	0.77	0.000E+00
82	VACUUM VESSEL	7.656E+05	4.724E+08	0.77	1.062E-07
83	VACUUM VESSEL	7.656E+05	7.725E+08	0.77	9.257E-06
84	VACUUM VESSEL	4.207E+05	4.732E+08	0.77	1.096E-03
85	VACUUM VESSEL	4.207E+05	1.581E+09	0.77	9.806E-06
87	VACUUM VESSEL	5.513E+04	3.453E+09	0.83	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	2.519E+08	1.45	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	2.759E+08	1.45	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	1.621E+07	1.46	0.000E+00
93	TOR.FIELD COILS,	4.728E+05	3.229E+07	1.45	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	6.319E+07	1.45	1.144E-05
95	TOR.FIELD COILS,	1.518E+06	1.855E+08	1.46	3.178E-08
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	2.851E+02	0.25	4.568E-16
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.369E+12	0.78	0.000E+00
121	FIRST WALL	4.409E+05	2.800E+11	0.80	0.000E+00
123	FIRST WALL	2.541E+05	2.838E+11	0.80	0.000E+00
124	FIRST WALL	4.811E+04	1.894E+11	0.79	0.000E+00
125	FIRST WALL	3.453E+04	1.720E+11	0.79	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.554E+10	1.01	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.192E+10	1.02	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.250E+10	1.02	0.000E+00
134	BREEDING BLANKET	1.642E+05	8.172E+09	1.00	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.271E+10	1.00	0.000E+00
140	VACUUM VESSEL	1.284E+06	3.770E+09	0.84	0.000E+00
141	VACUUM VESSEL	7.853E+05	2.048E+09	0.87	0.000E+00
143	VACUUM VESSEL	4.546E+05	2.260E+09	0.86	0.000E+00

150	VACUUM VESSEL	1.512E+06	2.230E+09	0.78	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.302E+09	0.79	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.303E+09	0.78	1.138E-05
160	VACUUM VESSEL	3.480E+06	4.079E+08	0.76	1.470E+01
161	VACUUM VESSEL	2.079E+06	3.568E+08	0.77	3.092E+00
163	VACUUM VESSEL	1.203E+06	3.103E+08	0.77	5.362E+00
170	TOR.FIELD COILS,	2.628E+06	3.308E+07	1.44	3.182E-03
171	TOR.FIELD COILS,	2.628E+06	7.274E+07	1.42	5.667E-03
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	3.795E+05	2.21	1.590E-08
220	BIOL. SHIELD	2.020E+07	1.228E+06	2.20	5.395E-06
230	BIOL. SHIELD	3.322E+07	1.023E+06	2.20	1.527E-05
231	BIOL. SHIELD	9.114E+06	2.898E+02	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	1.026E+05	2.21	1.107E-08
262	POL.FIELD COILS,	2.031E+05	1.297E+07	1.44	5.894E-08
272	POL.FIELD COILS,	6.647E+05	2.045E+08	1.43	5.391E-03
280	POL.FIELD COILS,	6.647E+05	2.643E+07	1.38	3.555E-04
292	POL.FIELD COILS,	2.031E+05	4.472E+07	1.45	2.486E-12
330	EXHAUST PORT	4.762E+06	1.421E+06	0.76	1.428E-03
340	EXHAUST PORT	4.076E+06	3.114E+06	0.78	7.736E-02
350	EXHAUST PORT	6.016E+05	1.335E+08	0.78	4.214E-05
360	EXHAUST PORT	7.025E+05	1.988E+08	0.78	1.627E-01
370	EXHAUST PORT	4.841E+05	5.348E+07	0.83	1.101E-01
388	EXHAUST PORT	9.105E+05	1.169E+08	0.77	3.774E-02
389	EXHAUST PORT	3.029E+06	5.868E+06	0.76	1.733E-02
TOTAL					2.357E+01

TIME= 390.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.241E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	2.310E+11	0.81	0.000E+00
41	FIRST WALL	2.518E+05	2.170E+11	0.81	0.000E+00
42	FIRST WALL	7.777E+04	1.485E+11	0.81	0.000E+00
43	FIRST WALL	7.777E+04	1.486E+11	0.80	0.000E+00
50	INB. BLANKET	5.350E+05	1.785E+10	1.02	0.000E+00
51	INB. BLANKET	5.350E+05	1.836E+10	1.02	0.000E+00
52	INB. BLANKET	3.677E+05	9.973E+09	1.02	0.000E+00
53	INB. BLANKET	3.677E+05	1.094E+10	1.02	0.000E+00
60	VACUUM VESSEL	4.037E+05	7.568E+09	0.89	0.000E+00
61	VACUUM VESSEL	4.037E+05	7.257E+09	0.90	0.000E+00
62	VACUUM VESSEL	2.540E+05	3.260E+09	0.87	0.000E+00
63	VACUUM VESSEL	2.540E+05	5.135E+09	0.89	0.000E+00
64	VACUUM VESSEL	1.237E+05	3.669E+09	0.88	0.000E+00
65	VACUUM VESSEL	8.731E+04	8.012E+09	0.89	0.000E+00
67	VACUUM VESSEL	3.020E+04	3.784E+10	0.87	0.000E+00
70	VACUUM VESSEL	4.514E+05	4.146E+09	0.79	0.000E+00
71	VACUUM VESSEL	4.514E+05	3.960E+09	0.80	0.000E+00
72	VACUUM VESSEL	3.162E+05	1.808E+09	0.78	0.000E+00
73	VACUUM VESSEL	3.162E+05	2.691E+09	0.79	0.000E+00
74	VACUUM VESSEL	1.609E+05	1.822E+09	0.79	0.000E+00
75	VACUUM VESSEL	1.130E+05	3.964E+09	0.81	0.000E+00
77	VACUUM VESSEL	4.670E+04	7.880E+09	0.82	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.162E+09	0.77	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.185E+09	0.77	0.000E+00
82	VACUUM VESSEL	7.656E+05	3.959E+08	0.77	8.965E-08
83	VACUUM VESSEL	7.656E+05	6.476E+08	0.77	7.843E-06
84	VACUUM VESSEL	4.207E+05	3.966E+08	0.77	9.110E-04
85	VACUUM VESSEL	4.207E+05	1.326E+09	0.78	8.147E-06
87	VACUUM VESSEL	5.513E+04	2.863E+09	0.83	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	2.088E+08	1.46	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	2.287E+08	1.46	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	1.343E+07	1.47	0.000E+00
93	TOR.FIELD COILS,	4.728E+05	2.674E+07	1.46	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	5.241E+07	1.46	1.118E-05
95	TOR.FIELD COILS,	1.518E+06	1.539E+08	1.47	2.863E-08
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	2.371E+02	0.25	3.634E-16
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	1.115E+12	0.79	0.000E+00
121	FIRST WALL	4.409E+05	2.285E+11	0.81	0.000E+00
123	FIRST WALL	2.541E+05	2.317E+11	0.81	0.000E+00
124	FIRST WALL	4.811E+04	1.567E+11	0.80	0.000E+00
125	FIRST WALL	3.453E+04	1.424E+11	0.80	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.501E+10	1.03	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.168E+10	1.03	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.225E+10	1.03	0.000E+00
134	BREEDING BLANKET	1.642E+05	8.010E+09	1.01	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.247E+10	1.02	0.000E+00
140	VACUUM VESSEL	1.284E+06	3.165E+09	0.85	0.000E+00
141	VACUUM VESSEL	7.853E+05	1.720E+09	0.87	0.000E+00
143	VACUUM VESSEL	4.546E+05	1.898E+09	0.86	0.000E+00

150	VACUUM VESSEL	1.512E+06	1.871E+09	0.78	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.094E+09	0.79	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.094E+09	0.78	9.458E-06
160	VACUUM VESSEL	3.480E+06	3.418E+08	0.77	1.223E+01
161	VACUUM VESSEL	2.079E+06	2.993E+08	0.78	2.577E+00
163	VACUUM VESSEL	1.203E+06	2.602E+08	0.77	4.463E+00
170	TOR.FIELD COILS.	2.628E+06	2.741E+07	1.45	3.088E-03
171	TOR.FIELD COILS.	2.628E+06	6.025E+07	1.44	5.472E-03
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.727E+05	1.14	1.063E-10
220	BIOL. SHIELD	2.020E+07	5.591E+05	1.14	4.616E-08
230	BIOL. SHIELD	3.322E+07	4.658E+05	1.14	1.289E-07
231	BIOL. SHIELD	9.114E+06	1.315E+02	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	4.668E+04	1.14	7.508E-11
262	POL.FIELD COILS.	2.031E+05	1.074E+07	1.45	5.741E-08
272	POL.FIELD COILS.	6.647E+05	1.694E+08	1.44	5.205E-03
280	POL.FIELD COILS.	6.647E+05	2.192E+07	1.40	3.380E-04
292	POL.FIELD COILS.	2.031E+05	3.712E+07	1.46	2.029E-12
330	EXHAUST PORT	4.762E+06	1.188E+06	0.76	1.187E-03
340	EXHAUST PORT	4.076E+06	2.602E+06	0.78	6.450E-02
350	EXHAUST PORT	6.016E+05	1.117E+08	0.78	3.581E-05
360	EXHAUST PORT	7.025E+05	1.668E+08	0.78	1.358E-01
370	EXHAUST PORT	4.841E+05	4.502E+07	0.83	9.248E-02
388	EXHAUST PORT	9.105E+05	9.806E+07	0.77	3.142E-02
389	EXHAUST PORT	3.029E+06	4.922E+06	0.76	1.442E-02
TOTAL					1.962E+01

TIME= 460.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	3.172E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	1.534E+11	0.83	0.000E+00
41	FIRST WALL	2.518E+05	1.441E+11	0.83	0.000E+00
42	FIRST WALL	7.777E+04	9.903E+10	0.83	0.000E+00
43	FIRST WALL	7.777E+04	9.829E+10	0.82	0.000E+00
50	INB. BLANKET	5.350E+05	1.711E+10	1.03	0.000E+00
51	INB. BLANKET	5.350E+05	1.758E+10	1.03	0.000E+00
52	INB. BLANKET	3.677E+05	9.564E+09	1.03	0.000E+00
53	INB. BLANKET	3.677E+05	1.051E+10	1.03	0.000E+00
60	VACUUM VESSEL	4.037E+05	4.801E+09	0.91	0.000E+00
61	VACUUM VESSEL	4.037E+05	4.624E+09	0.92	0.000E+00
62	VACUUM VESSEL	2.540E+05	2.032E+09	0.89	0.000E+00
63	VACUUM VESSEL	2.540E+05	3.263E+09	0.90	0.000E+00
64	VACUUM VESSEL	1.237E+05	2.303E+09	0.90	0.000E+00
65	VACUUM VESSEL	8.731E+04	5.074E+09	0.91	0.000E+00
67	VACUUM VESSEL	3.020E+04	2.424E+10	0.89	0.000E+00
70	VACUUM VESSEL	4.514E+05	2.427E+09	0.80	0.000E+00
71	VACUUM VESSEL	4.514E+05	2.317E+09	0.80	0.000E+00
72	VACUUM VESSEL	3.162E+05	1.044E+09	0.79	0.000E+00
73	VACUUM VESSEL	3.162E+05	1.581E+09	0.80	0.000E+00
74	VACUUM VESSEL	1.609E+05	1.067E+09	0.80	0.000E+00
75	VACUUM VESSEL	1.130E+05	2.358E+09	0.82	0.000E+00
77	VACUUM VESSEL	4.670E+04	4.769E+09	0.83	0.000E+00
80	VACUUM VESSEL	8.113E+05	6.588E+08	0.77	0.000E+00
81	VACUUM VESSEL	8.113E+05	6.724E+08	0.77	0.000E+00
82	VACUUM VESSEL	7.656E+05	2.240E+08	0.77	5.718E-08
83	VACUUM VESSEL	7.656E+05	3.683E+08	0.78	5.013E-06
84	VACUUM VESSEL	4.207E+05	2.264E+08	0.78	4.828E-04
85	VACUUM VESSEL	4.207E+05	7.610E+08	0.78	4.299E-06
87	VACUUM VESSEL	5.513E+04	1.741E+09	0.85	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	1.088E+08	1.47	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	1.191E+08	1.47	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	6.997E+06	1.48	0.000E+00
93	TOR.FIELD COILS,	4.728E+05	1.388E+07	1.47	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	2.732E+07	1.47	1.054E-05
95	TOR.FIELD COILS,	1.518E+06	8.027E+07	1.48	2.238E-08
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	1.245E+02	0.25	1.632E-16
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	7.414E+11	0.80	0.000E+00
121	FIRST WALL	4.409E+05	1.520E+11	0.82	0.000E+00
123	FIRST WALL	2.541E+05	1.544E+11	0.82	0.000E+00
124	FIRST WALL	4.811E+04	1.042E+11	0.81	0.000E+00
125	FIRST WALL	3.453E+04	9.442E+10	0.81	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.398E+10	1.04	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.121E+10	1.04	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.175E+10	1.04	0.000E+00
134	BREEDING BLANKET	1.642E+05	7.688E+09	1.02	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.198E+10	1.03	0.000E+00
140	VACUUM VESSEL	1.284E+06	1.956E+09	0.86	0.000E+00
141	VACUUM VESSEL	7.853E+05	1.083E+09	0.89	0.000E+00
143	VACUUM VESSEL	4.546E+05	1.193E+09	0.88	0.000E+00

150	VACUUM VESSEL	1.512E+06	1.080E+09	0.79	0.000E+00
151	VACUUM VESSEL	9.163E+05	6.389E+08	0.80	0.000E+00
153	VACUUM VESSEL	5.304E+05	6.397E+08	0.79	4.989E-06
160	VACUUM VESSEL	3.480E+06	1.928E+08	0.77	6.520E+00
161	VACUUM VESSEL	2.079E+06	1.715E+08	0.78	1.384E+00
163	VACUUM VESSEL	1.203E+06	1.479E+08	0.77	2.383E+00
170	TOR.FIELD COILS.	2.628E+06	1.424E+07	1.47	2.864E-03
171	TOR.FIELD COILS.	2.628E+06	3.127E+07	1.46	5.015E-03
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	1.163E+04	1.15	1.044E-10
220	BIOL. SHIELD	2.020E+07	3.798E+04	1.14	4.537E-08
230	BIOL. SHIELD	3.322E+07	3.211E+04	1.14	1.267E-07
231	BIOL. SHIELD	9.114E+06	8.289E+00	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	3.161E+03	1.15	7.367E-11
262	POL.FIELD COILS.	2.031E+05	5.576E+06	1.47	5.360E-08
272	POL.FIELD COILS.	6.647E+05	8.792E+07	1.46	4.768E-03
280	POL.FIELD COILS.	6.647E+05	1.142E+07	1.44	2.988E-04
292	POL.FIELD COILS.	2.031E+05	1.939E+07	1.48	1.160E-12
330	EXHAUST PORT	4.762E+06	6.509E+05	0.76	6.290E-04
340	EXHAUST PORT	4.076E+06	1.480E+06	0.79	3.473E-02
350	EXHAUST PORT	6.016E+05	6.291E+07	0.79	2.125E-05
360	EXHAUST PORT	7.025E+05	9.496E+07	0.79	7.339E-02
370	EXHAUST PORT	4.841E+05	2.747E+07	0.85	5.165E-02
388	EXHAUST PORT	9.105E+05	5.564E+07	0.77	1.682E-02
389	EXHAUST PORT	3.029E+06	2.753E+06	0.76	7.673E-03
TOTAL					1.049E+01

TIME= 720.00 DAYS

CONTRIBUTIONS TO DOSE AT MEASURING POINT:

FROM NO.	CELLNAME	VOLUME CM**3	SPEC.ACT. 1/CM**3/S	AV.ENERGY MEV	DOSE GRAY/H
10	PLASMA	1.882E+07	2.927E+02	0.00	0.000E+00
40	FIRST WALL	2.518E+05	6.525E+10	0.88	0.000E+00
41	FIRST WALL	2.518E+05	6.152E+10	0.88	0.000E+00
42	FIRST WALL	7.777E+04	4.241E+10	0.88	0.000E+00
43	FIRST WALL	7.777E+04	4.142E+10	0.87	0.000E+00
50	INB. BLANKET	5.350E+05	1.538E+10	1.04	0.000E+00
51	INB. BLANKET	5.350E+05	1.578E+10	1.04	0.000E+00
52	INB. BLANKET	3.677E+05	8.602E+09	1.04	0.000E+00
53	INB. BLANKET	3.677E+05	9.481E+09	1.04	0.000E+00
60	VACUUM VESSEL	4.037E+05	1.543E+09	0.96	0.000E+00
61	VACUUM VESSEL	4.037E+05	1.500E+09	0.97	0.000E+00
62	VACUUM VESSEL	2.540E+05	6.264E+08	0.94	0.000E+00
63	VACUUM VESSEL	2.540E+05	1.104E+09	0.96	0.000E+00
64	VACUUM VESSEL	1.237E+05	7.154E+08	0.96	0.000E+00
65	VACUUM VESSEL	8.731E+04	1.658E+09	0.96	0.000E+00
67	VACUUM VESSEL	3.020E+04	9.064E+09	0.95	0.000E+00
70	VACUUM VESSEL	4.514E+05	5.811E+08	0.86	0.000E+00
71	VACUUM VESSEL	4.514E+05	5.509E+08	0.86	0.000E+00
72	VACUUM VESSEL	3.162E+05	2.344E+08	0.84	0.000E+00
73	VACUUM VESSEL	3.162E+05	3.873E+08	0.86	0.000E+00
74	VACUUM VESSEL	1.609E+05	2.586E+08	0.86	0.000E+00
75	VACUUM VESSEL	1.130E+05	6.098E+08	0.88	0.000E+00
77	VACUUM VESSEL	4.670E+04	1.336E+09	0.89	0.000E+00
80	VACUUM VESSEL	8.113E+05	1.341E+08	0.82	0.000E+00
81	VACUUM VESSEL	8.113E+05	1.375E+08	0.82	0.000E+00
82	VACUUM VESSEL	7.656E+05	4.518E+07	0.82	1.237E-08
83	VACUUM VESSEL	7.656E+05	7.623E+07	0.82	1.081E-06
84	VACUUM VESSEL	4.207E+05	4.833E+07	0.82	5.510E-05
85	VACUUM VESSEL	4.207E+05	1.654E+08	0.83	4.772E-07
87	VACUUM VESSEL	5.513E+04	5.107E+08	0.91	0.000E+00
90	TOR.FIELD COILS,	1.203E+06	1.075E+07	1.49	0.000E+00
91	TOR.FIELD COILS,	1.203E+06	1.178E+07	1.49	0.000E+00
92	TOR.FIELD COILS,	4.728E+05	7.333E+05	1.50	0.000E+00
93	TOR.FIELD COILS,	4.728E+05	1.381E+06	1.49	0.000E+00
94	TOR.FIELD COILS,	1.518E+06	2.682E+06	1.49	9.153E-06
95	TOR.FIELD COILS,	1.518E+06	7.818E+06	1.50	1.470E-08
100	POL.FIELD COILS,	1.023E+06	0.000E+00	0.00	0.000E+00
101	POL.FIELD COILS,	1.023E+06	1.179E+01	0.25	8.337E-18
106	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
107	POL.FIELD COILS,	2.406E+05	0.000E+00	0.00	0.000E+00
120	FIRST WALL	6.972E+05	3.305E+11	0.87	0.000E+00
121	FIRST WALL	4.409E+05	6.584E+10	0.88	0.000E+00
123	FIRST WALL	2.541E+05	6.703E+10	0.88	0.000E+00
124	FIRST WALL	4.811E+04	4.344E+10	0.86	0.000E+00
125	FIRST WALL	3.453E+04	3.901E+10	0.87	0.000E+00
130	BREEDING BLANKET	3.085E+06	2.157E+10	1.04	0.000E+00
131	BREEDING BLANKET	1.919E+06	1.009E+10	1.04	0.000E+00
133	BREEDING BLANKET	1.110E+06	1.058E+10	1.04	0.000E+00
134	BREEDING BLANKET	1.642E+05	6.924E+09	1.03	0.000E+00
135	BREEDING BLANKET	1.162E+05	1.081E+10	1.04	0.000E+00
140	VACUUM VESSEL	1.284E+06	5.812E+08	0.92	0.000E+00
141	VACUUM VESSEL	7.853E+05	3.424E+08	0.94	0.000E+00
143	VACUUM VESSEL	4.546E+05	3.781E+08	0.93	0.000E+00

150	VACUUM VESSEL	1.512E+06	2.427E+08	0.84	0.000E+00
151	VACUUM VESSEL	9.163E+05	1.517E+08	0.85	0.000E+00
153	VACUUM VESSEL	5.304E+05	1.542E+08	0.84	5.528E-07
160	VACUUM VESSEL	3.480E+06	3.801E+07	0.82	7.827E-01
161	VACUUM VESSEL	2.079E+06	3.698E+07	0.83	1.715E-01
163	VACUUM VESSEL	1.203E+06	3.066E+07	0.82	2.882E-01
170	TOR.FIELD COILS,	2.628E+06	1.409E+06	1.49	2.434E-03
171	TOR.FIELD COILS,	2.628E+06	3.059E+06	1.49	4.186E-03
200	BIOL. SHIELD	2.384E+06	0.000E+00	0.00	0.000E+00
210	BIOL. SHIELD	4.907E+06	7.545E+02	1.15	1.043E-10
220	BIOL. SHIELD	2.020E+07	2.752E+03	1.14	4.534E-08
230	BIOL. SHIELD	3.322E+07	2.765E+03	1.14	1.266E-07
231	BIOL. SHIELD	9.114E+06	7.333E-03	0.00	0.000E+00
240	BIOL. SHIELD	8.734E+06	0.000E+00	0.00	0.000E+00
250	BIOL. SHIELD	1.812E+07	2.198E+02	1.15	7.366E-11
262	POL.FIELD COILS,	2.031E+05	5.298E+05	1.49	4.593E-08
272	POL.FIELD COILS,	6.647E+05	8.368E+06	1.49	3.978E-03
280	POL.FIELD COILS,	6.647E+05	1.062E+06	1.48	2.353E-04
292	POL.FIELD COILS,	2.031E+05	1.860E+06	1.50	2.174E-13
330	EXHAUST PORT	4.762E+06	1.042E+05	0.81	7.311E-05
340	EXHAUST PORT	4.076E+06	3.044E+05	0.84	4.324E-03
350	EXHAUST PORT	6.016E+05	1.203E+07	0.83	4.035E-06
360	EXHAUST PORT	7.025E+05	1.897E+07	0.84	9.387E-03
370	EXHAUST PORT	4.841E+05	7.686E+06	0.91	7.375E-03
388	EXHAUST PORT	9.105E+05	1.138E+07	0.84	2.093E-03
389	EXHAUST PORT	3.029E+06	5.083E+05	0.81	9.195E-04
TOTAL					1.277E+00

Risø National Laboratory **Risø - M - 2771**

CALCULATION OF THE GAMMA RADIATION LEVELS IN AND AROUND THE NET-DN TOKAMAK REACTOR

C.F. Højerup

Date July 1989

Department or group
Energy Technology

Groups own registration number(s)
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Abstract. Calculations of the gamma doses at a TOKAMAK fusion reactor, the NET-DN (1988) are presented. Neutron fluxes in the structures of the reactor are calculated by Monte Carlo methods (MCNP-2) and activations from the neutron induced reactions are determined by the ACTIVA computer programme. By Monte Carlo methods and the application of an approximative reciprocity principle, the gamma fluxes and doses are finally calculated.

Descriptors - INIS

COMPUTER CALCULATIONS; GAMMA RADIATION; MONTE CARLO METHOD; NET TOKAMAK; NUMERICAL DATA; RADIATION DOSES

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